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Commonwealth of Massachusetts.

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REPORT OF THE COMMISSIONERS

TO THE

EXPOSITION AT VIENNA.

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FEBRUARY, 1874.

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*Massachusetts Commissioners to the Exposition  
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## Commonwealth of Massachusetts.

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EXECUTIVE DEPARTMENT, BOSTON, February 6, 1874.

*To the Honorable Senate and House of Representatives :—*

Herewith I have the honor to lay before the legislature the Reports of Hon. Charles Francis Adams, Jr., Hon. Horatio G. Knight, and Hamilton A. Hill, Esq., members of the Commission from this Commonwealth to the Vienna Exposition, appointed under the Resolves of last March.

W. B. WASHBURN.

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# EXPOSITION AT VIENNA—1873.

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## REPORT OF COMMISSIONER ADAMS.

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As Commissioner of the State of Massachusetts, appointed under chapter 6 of the Resolves of 1873, to visit the Universal Exposition at Vienna, I have the honor to submit the following Report :—

Under the first section of the Resolve referred to, the governor, with the advice and consent of the council, was authorized to appoint a citizen of the Commonwealth, and such associates as might be necessary, to visit the Universal Exposition at Vienna, to assist the contributors from the State, to examine the various industries, manufactures and economies which might be exhibited or presented, and to report thereon to the legislature of 1874. A sum not exceeding \$12,000 was appropriated to carry into effect the provisions of the Resolve; which was passed and received the executive approval on the 3d of March, just fifty-eight days before the time fixed for the opening of the Exposition. Upon the 19th of the same month the nomination of the Commissioner was made and approved by the council, and eight days later Gen. John C. Palfrey, of Lowell, Hon. H. G. Knight, of Easthampton, and H. A. Hill, Esq., of Worcester, were appointed Associate Commissioners, with Mr. Frank D. Millett as secretary. A number of other gentlemen were at the same time joined to the Commission in a purely complimentary capacity.

Of the gentlemen designated as Associate Commissioners, Messrs. Knight and Hill accepted their appointments, but that of Gen. Palfrey was declined on account of conflicting business relations. In the original organization of the Com-

mission it had been supposed that Gen. Palfrey would represent the largest and most important material interest of the Commonwealth, that of textile fabrics. His intimate acquaintance with these, and with the machinery used in their production, qualified him in an eminent degree to render service of real value. For this and other reasons his inability to accept the appointment proved in the event a thing deeply to be regretted. Of the other gentlemen appointed, Mr. Hill only was at the time in America. Mr. Knight was travelling in Italy and Mr. Millett was just completing his studies at the School of Art at Antwerp.

As the commissions of the several appointees did not issue until the 20th of March, and the letter of instructions drawn up for the guidance of the Commissioner was dated subsequently to that time, it naturally followed, as the Exposition was opened upon the day (May 1) which had been designated, that before arriving on the ground the Commissioners had no opportunity to confer with each other. They could not, therefore, decide upon any line of conduct, nor in any way organize in advance, either to aid the Massachusetts expositors or to agree upon a division of their work. In point of fact, they first met at Vienna several weeks after the Exposition was open to the public, and about the time that the American department began to assume an appearance of order.

It hardly needs to be said that this was a most unfortunate circumstance, both for the Commission itself and for the expositors from Massachusetts; but under the circumstances it could not be avoided. Where men who are to act together in the performance of somewhat difficult duties in a foreign country are at the time of their appointment, immediately before those duties are to commence, both personally unknown to each other and scattered over two continents, it is not easy to concentrate them for action. Everything was, in this case, done which could be done. Mr. Millett was communicated with and went immediately to Vienna, under instructions to effect such preliminary arrangements as might be practicable. He arrived there during the latter part of April, but was obliged to return to Antwerp before the 1st of May, necessarily having accomplished little, if anything. He was unable to get



back to Vienna until the 7th of May. Mr. Hill and myself sailed from America on the 13th of April. Shortly after landing in Europe, I heard in Paris of the unfortunate difficulties which had arisen in the American department of the Exposition, and of the suspension of the United States Commissioners by the authorities at Washington. Thereupon I at once went to Vienna, where I arrived on the evening of the 1st of May, the day upon which the formal inaugurating ceremonies had taken place. I immediately put my own services, and those of the other gentlemen composing the State Commission, at the disposal of the American Minister and of those temporarily in charge of the American department, and, the occasion seeming to be one of a somewhat pressing nature, applied myself to the work of obtaining information as to the whereabouts of my colleagues. Certainly no circumstances could well have arisen in which a well organized and self-possessed state commission might have proved of greater service, or have more fully justified its formation, than were then presented. The condition of affairs in the American department was disgraceful, ludicrous and mortifying. The confusion was apparently complete. The work to be done was neither large nor difficult,—hardly equalling, indeed, the arrangements in this country of any ordinary Institute display or considerable County fair. Had any state commission been upon the spot, organized in advance, understanding itself and knowing both what ought to be done and how to do it, the conduct of the matter must inevitably and naturally have fallen into its hands. The difficulty would then at once have disappeared. Unfortunately, so far as the bringing about results was concerned, the Massachusetts Commission was in a less effective state, if such a thing were possible, even than that of the United States. Just appointed and wholly unorganized, its members scattered over Europe, and in no communication with each other, it illustrated with singular happiness the ordinary result of tardy public action. When, therefore, Mr. Jay and the gentlemen temporarily in charge expressed the utmost gratification at the prospect of having some organized body to relieve them from the embarrassing position in which they found themselves, it at once became evident that the Massachusetts Commission was in no condi-

tion to perform that service. Before it could be made so, even through the most energetic telegraphing and correspondence, the occasion, fortunately for it, had passed away. While I was anxiously looking for the arrival of my several associates, the appointment of Mr. Jackson S. Schultz as United States Commissioner, in place of Gen. Van Buren, was announced, and at once solved the difficulty.

In regard to the scandals and difficulties which gave such an unenviable notoriety to the American department during this period of the Exposition, neither my associates nor myself at the time or since have found it necessary to express, or indeed to form, any opinion. It was painfully evident that the mismanagement had been complete from the beginning forward. It required no investigation to make that fact patent to any one. As to who was responsible for this result, or the motives which actuated them, these were subjects which it was wholly unnecessary for us to pass upon. After the arrival of Mr. Schultz, therefore, it only remained for us to consider maturely why we had been sent to Vienna, and, having arrived at some definite conclusions upon that subject, to devote ourselves to the work before us.

Mr. Millett returned from Antwerp, and reported himself as ready to assume his duties as secretary on the 7th of May. Mr. Hill arrived upon the 11th of the same month. It was not until the 24th of May that Mr. Knight found himself able to reach Vienna, and his engagements in America were such that he was unable to remain there after the 26th of June. Consequently the Commission was deprived after that time of his assistance, and was practically reduced to Mr. Hill, Mr. Millett and myself. An office was secured and opened on the 16th of May; from which time until the 8th of October one or more of the Commissioners was in constant attendance at it. It was then finally closed by Mr. Millett, and all its documents and records forwarded to America. I had previously left Vienna on the 10th of August, and Mr. Hill had followed on the 1st of September. Altogether the office was open and the Commissioners were in Vienna during five months of the Exposition, which lasted in all but six months.

I do not propose to enter into any general, historical, descriptive or statistical report of the Vienna Exposition. Upon

all these matters the country has been kept so very fully informed by the writers for the public press, that any further details as regards them in my power to supply would seem to be quite superfluous. As, however, preparations are now making for the American Centennial of 1876, in which Massachusetts as a State will not improbably feel obliged to take a prominent part, I shall briefly refer to a few points, a due consideration of which, as it seems to me, may save us from grave mistakes. It is true that Massachusetts is not directly responsible for this undertaking, and can exercise but a very limited influence in its direction. But if, as is proposed, it is to be a national affair,—and as such it will necessarily be regarded in all foreign countries,—the practical questions connected with it become matters of moment to each of the several States.

As a universal exposition, that of Vienna was undoubtedly the largest and most ambitious attempt of the kind which has yet been made. In some respects it was a most brilliant and gratifying success; in others it cannot but be considered as a very lamentable failure. From the careful study of it in each aspect, many useful lessons touching the coming Centennial might be drawn. Among the features of success were the structures and the surrounding grounds, which were all upon a scale of unprecedented magnitude. Yet magnificent and imposing as respects constructive skill and the space covered by them as these unquestionably were, the buildings can hardly be considered as having been well adapted to the purposes for which they were designed. They were laid out for their proposed occupants on the geographical plan: that is, taking them in order, the visitor passed through the whole range of countries as they occupy the surface of the earth, the Americas being at one extremity and Eastern Asia at the other. This is an admirable arrangement for a bazaar, in which the largest possible sales by expositors is the single end in view; and it so proved in this case. If, however, an exposition building is designed, not as a general sales-room of the world, but as a competitive field of excellence, a worse arrangement than that described could scarcely be devised. At Vienna, productions of the same nature from different countries were not only not brought into contrast and com-

parison, as at the last Paris Exposition, but they seemed to be so placed that both comparison and contrast were impossible. Not only a guide, but a very experienced and competent guide,—one who had made a special study of a class of objects,—was an absolute necessity to any one who sought to examine all that the Exposition contained of objects of that class. Both morally and physically, the search was made as wearisome and exhausting as was possible. The investigator was equally oppressed with the number and variety of the exhibits discovered, and by the distance traversed in the journey of discovery. The method of arrangement thus became a practical matter, detracting most seriously from the general popularity of the enterprise. For the great mass of those, the presence of whom decides the success or failure of such undertakings,—the travellers and the buyers,—are brought together from motives of curiosity or in search of amusement. One principal object always, therefore, to be kept in view should be to render the work of examination as little fatiguing as possible. At Vienna it was a severe and unattractive labor. The Exposition, therefore, speedily became unpopular with the general public, and very few, who were not compelled to, paid it either long or frequent visits.

This deficiency as regards detail was in fact the point of weakness throughout the undertaking. The conception was very large and fine, perhaps too much so, but it was not sustained by any corresponding faculty for organization. A few men, indeed it might practically be said that one man, attempted to supervise everything and to do everything. Subordinates were mere ciphers. But to secure the success of an enterprise of this description, a good organizing and executive mind is even more indispensable than a large conceiving mind. Indeed, it is not difficult to imagine, or to procure designs for the largest buildings or the most perfect collection of industrial products which the world has yet seen, and by a sufficiently lavish expenditure of money these conceptions may be more or less fully realized. The difficulty is in producing, with the least degree of friction and at the smallest cost, practical and harmonious results. In neither of these respects could the Vienna Exposition be regarded as a success. Indeed, few more perilous industrial undertakings could be

devised for any community than the embarking in a world's fair, without first knowing exactly where to find that one man who both has a perfectly definite conception of what it is proposed to do and an equally definite conception of how it is to be done. An exposition cannot be made, through repeated failure, to result in ultimate success. Its fate depends wholly upon the concentration of its management and the executive capacity of its manager. At Vienna, while the concentration was perfect, the executive capacity was deficient. The danger for Philadelphia will probably be found in the attempt to evolve a management out of a caucus, which cannot but result in the absence of every accessory to an assured success.

Another point in its history having a decided significance for the Centennial, was the failure of the Vienna Exposition in respect to the number of visitors who attended it. It is true that this deficiency was partly due to special causes. A wide-spread apprehension of the cholera prevailed throughout Europe during almost the whole summer, and most exaggerated reports of its ravages at Vienna were everywhere current. This, however, was but one of the minor causes which deterred people from going there; it was not, indeed, even so influential as the systematic and outrageous extortions practised by the Viennese upon their visitors. During the later months of the Exposition these were not, perhaps, greater than might have been expected in any city under similar circumstances. A lasting reputation had, however, been achieved during the earlier weeks. The Viennese then showed the full spirit which ordinarily takes possession of the inhabitants of a provincial city which thinks it has for a time secured to itself the first-class attraction of a metropolis. It was thought that the whole world must come to the Exposition,—that it could not stay away; and the natives prepared to take full advantage of the necessity. During the few days of assured confidence in the unparalleled success of their great show, the extortions practised upon strangers were so unblushing, so impudent, so aggravating, as to produce a lasting impression throughout Europe. This was especially the case with the English and the Americans,—the two people most lavish in their expenditure of money,—among whom a bitter prejudice was created which was not subsequently effaced.

But apart from these two minor considerations, which unquestionably had a considerable effect in diminishing the number of visitors after the month of May, there was another and far more fundamental fact which the Austrian authorities lost sight of in planning their enterprise, and which their experience should warn us not to disregard. There is excellent reason to believe that their experiment was upon a scale altogether too large for its base and surroundings. In other words, it is very questionable whether an exposition of the superlative grandeur of that of Vienna can ever be successfully undertaken in any city of the second class. There are two cities,—London and Paris,—sufficiently large and sufficiently central to sustain a world's fair on the largest scale;—it is very doubtful if there are more than two. At least one-half probably of those who enter the doors of an international exposition belong to the population of the city in which it is held. That population must always constitute the great basis of attendance. In this respect no other cities at all approach London or Paris, and through them also passes the whole world which travels, whether for business or pleasure. It is not so with Vienna, and it is less so yet with Philadelphia. With neither of these cities are strangers familiar. They will, indeed, go to them if drawn there by sufficient attraction, but they cannot be induced to remain in them. This fact was singularly illustrated during the last summer. The capital of the Austrian Empire certainly has the reputation of being a gay, a brilliant, an interesting and not a peculiarly severe or virtuous city. Nevertheless, even during the last summer, it was found impossible to keep the throng of travellers there for any length of time. It was most noticeable that numbers continually arrived with the expressed intention of passing weeks in the study of the Exposition, as had been so much the practise among strangers, both at London in 1862 and at Paris in 1867. Almost invariably, however, the stay of such persons was limited to two or perhaps three days. They seemed to weary of the place, and of the Exposition even more than of the place. The latter oppressed them, and Vienna failed to attract them;—they were neither amused nor instructed nor comfortable. They soon realized that they were getting very little enjoyment in return for a very heavy expenditure,



and, accordingly, they went elsewhere. Day by day after the Exposition was opened, it thus became more and more apparent that it was a world's fair held at a point which was not a world's centre. On the contrary, the world had to go out of its way to get to it. Something more attractive than a universal exposition, no matter how wonderful, was required to keep people away from their familiar haunts. Notwithstanding every conceivable effort to create amusement in large things and in small,—from endless concerts and beer-gardens to the regularly arranged arrival and departure of every considerable sovereign or eminent public character in Europe,—there were, during the very months that the Exposition lasted, more travellers and strangers in either London or Paris than in Vienna, and they also remained in those cities for a longer time. The whole undertaking had, however, been planned upon the assumption that all previous efforts in the same line were to be wholly eclipsed. As respects magnitude of apparatus they were eclipsed, and the financial failure was in perfect correspondence. The necessary preparation to out-do everything which had gone before was made. Unfortunately, those for whose benefit it was made failed to respond.

The consequent financial experience was very suggestive. The appropriation originally made by the government on account of the Exposition was \$3,000,000, which it was further provided was in no case to be exceeded. The total cost will probably be found to amount to over \$12,000,000, as the receipts from visitors were scarcely sufficient to meet the current expenses; leaving a deficit of some \$9,000,000 to be met by the Austrian government. And yet, even from this lamentable showing, it would not be safe to draw any inferences in disparagement of the Vienna Exposition as affecting the people of Austria, or of the Centennial as affecting the people of this country. The influence of such an experience cannot easily be measured in dollars and cents. On the contrary, there can scarcely remain a doubt in the mind of any careful observer, at all familiar with the progress of recent Austrian development, that the Exposition, even had it resulted in a deficit twice as large as that stated, would have been worth far more than it cost. Its educational effects can

hardly fail to be incalculable. The people of Austria intellectually, politically and industrially are in a state of active transition. The disastrous results of the campaign of 1866 drove the Empire into a course of decided political and educational reform. The absolute necessity of a re-organization was made apparent even to those most wedded to the old ways, and from the battle of Sadowa may be dated a new era in Austrian history. Seven years of education had made their influence perceptibly felt in every department of national life, and not least in its industries. There was a general awakening. Upon a people in this receptive condition the effect of a universal exposition like that of the last summer cannot easily be overestimated. It is probably not too much to say that for the next score of years everything inventive or industrial in Austria will date a new impetus from it, as everything educational and political already dates from Sadowa.

Nor will the experience of Austria, if this expectation should be realized, be peculiar to herself. A remarkable illustration of a similar impetus given to English industries by the previous expositions at London was observable at Vienna. It was there generally conceded that the most brilliant success won was in the department of the ceramic arts, and in this the palm was generally conceded to the English exhibitors. The progress made by them, and the absolute excellence they had attained, were most noteworthy. This was attributed to the improved education and increased artistic taste of the country, largely due to the influence of the South Kensington Museum and the system of art schools of which that museum is the great centre. These again originated out of the first London Exposition of 1851, and remain as a lasting monument to its success and utility.

A more correct appreciation of circumstances and a more perfect organization of details, would obviate in a very great degree as respects the Centennial the danger of any such disastrous financial results as those experienced at Vienna. That which may be possible in London or Paris may be impracticable at Philadelphia. If, however, this appreciation of circumstances and regard to details could but be secured, it may well be questioned whether any civilized people is in a condition to derive more immediate or more im-



portant results from a successful world's fair, than are now the people of this country. They are in no respect in the condition of the people of Austria; but it was impossible to examine the rare display at Vienna, without being deeply impressed with a sense of the educational results to be derived by America from a similar experience. As respects taste and artistic development,—in all the results of a higher and more thorough education,—our people are as yet sadly deficient; they need an impetus. No one could walk through the Exposition at Vienna and not experience a realizing sense of the fact. Should the Philadelphia Centennial lead to such results with us as the Exposition of 1851 did with the people of England,—should it leave behind it with us, as that did with them, a keener appreciation both of our national shortcomings and our possibilities,—it will not be otherwise than a brilliant success, even if it bequeaths us also a deficit as large as that which the Austrian authorities are now contemplating with disappointment and dismay.

These are not, however, matters which my colleagues or myself were especially directed to investigate. The objects for which a state commission had been sent to Vienna, and which we were necessarily to keep in view, were more particularly expressed in the language of the Resolve authorizing our appointment, which has already been quoted, and in the letter of instructions of April 10th, addressed to me by the governor, a copy of which is appended to this report. Recurring to these, it will be observed that the duty of aiding the Massachusetts contributors was especially imposed upon us. In this respect we found the field of our usefulness extremely limited. Had the Commission been authorized and appointed a year earlier, the case might have been very different. The Commissioners then would have organized the Massachusetts exposition, would have been familiar with the conditions under which the contributions were to be forwarded and displayed, and would have been somewhat advised both as to what was expected of them and what it would be in their power to accomplish. As it was, all that was done in the way of organization at all, had been done by the Commissioners of the United States before our appointment was even contemplated. It was entirely out of the question, therefore,

for us to be of any service in the work of preparation, or to assist contributors in forwarding their goods. It only remained to hurry to Vienna, without the possibility of arriving there before every article should have been in its place. When we did arrive there, we found, it is true, nothing in place, and the Massachusetts expositors, in common with all of those from America, utterly paralyzed by the troubles in the United States Commission. I have already sufficiently referred to these, and to the extreme care with which my colleagues and myself abstained from all participation in them. Meanwhile, even had our Commission then been in a thoroughly effective condition, it would have been wholly out of the question for it to separate the Massachusetts from the other expositors. A state commission had, of course, no recognized position with the Austrian authorities, and could communicate with them only through the representative of the United States. There can hardly be said to have been any such representative until after the arrival of Mr. Schultz, when everything that could be done for the expositors of any State was done for all. Circumstances would afterwards occasionally arise to induce some Massachusetts exhibitor to apply to us for advice or assistance; such occurrences were, however, rare, and the matters presented trivial. In fact, judging by my own experience at Vienna, I should say that in this respect any state commission was wholly superfluous; no field of usefulness is open to it. It can, if properly organized, do a great deal of work of the utmost value in the earlier stages of preparation,—while the display of goods is being gotten together and forwarded,—but after the expositor is on the ground, he must necessarily look to the national representatives, and those of a State are, so far as he is concerned, of about as much value as would be those of his county or town. The most they can do is to be at hand in case they are wanted to supply a vacancy, such as arose in Vienna, among those really in charge. They then, however, cease to be State and become national commissioners.

As it was practically out of their power to render any material aid to the Massachusetts contributors, it only remained for the Commissioners to give their undivided attention to the work of investigation imposed upon them; to

examine the industries, manufactures and economies presented with a view to bringing back in a body of reports the largest amount possible of information likely to prove useful to the people of the State. I have no intention of attempting any elaborate report myself, either upon the exhibition as a whole or the American department in it, or upon the Massachusetts representation in that department. I do not either feel myself competent to undertake such a task, nor was I appointed with the expectation that I should do so. Speaking, generally, however, and taking into account the civilization, the wealth, the standing and above all the pride of the country which contributed it, the American department was the least creditable part of the Exposition. The exhibit of machinery saved it from being wholly discreditable, and the educational department excited some general interest. Including these redeeming features, however, the whole result would have reflected no credit whatever on a Worcester County fair.

The official classification divided the articles in the whole Exposition into twenty-six groups. In twenty-three of these America was more or less represented, though in all but one the representation was in no way calculated to give a correct impression of our progress or condition as a people. The difficulty had evidently lain in the work of preliminary organization. It was quite apparent from the most superficial examination that such articles as were there had been in greatest part gotten together at hap-hazard; and that, while few things had been judiciously selected, absolutely nothing had been rejected. It would have been far better, so far as the general impression created was concerned, if all else had been rejected and our contributions had been wholly confined to the hall of machinery. A walk through the American department left on the mind an unpleasant impression of meagreness in production, absence of taste and poverty of imagination, which was even painful if the visitor happened to approach it through the superb English and French displays next to it in order of arrangement.

Appended to this Report tables are submitted showing,—

*First.* The entire number of American exhibits, with the groups to which they severally belonged, and the medals or diplomas of each description awarded to them.

*Second.* A similar table relating solely to the Massachusetts exhibits.

*Third.* A table showing the contributions of the several States of the Union to each of the groups.

*Fourth.* The diplomas or medals awarded in each of the groups to the exhibits of the several States; and

*Fifth.* A table of thirty-two of the leading industries of Massachusetts reported in the last United States census, showing the number of establishments engaged in each and the total value of their annual production, with the number of exhibits contributed by them to the Exposition.

The last table reveals with sufficient distinctness the utterly imperfect character of the Massachusetts contributions, if they were intended in any way to reflect the industrial development of the State. Of the 3,926 establishments reported to the census as engaged in these thirty-two forms of production, but thirty-seven were represented. Seventeen of these thirty-seven contributions were in the single group of machinery. Twenty of the thirty-seven industries enumerated were wholly unrepresented. Among those thus conspicuous for their absence were the manufactures of cars, of agricultural implements, of cutlery, of drugs and chemicals, of paper, of glass, of clothing, of prints, of plated ware, of straw-work, of watches, of wire and worsted goods. Of the 1,123 establishments engaged in the manufacture of boots and shoes, three contributed. One solitary contributor, only, represented our annual production of \$45,000,000 of cotton goods. Our famous edge-tools, our India-rubber goods, our musical instruments and our woodenware numbered also one contributor each. Our woollen goods had two.

Turning to the several groups, and excluding the educational department, in regard to which a special report will be made by Mr. Philbrick, the commissioner in charge, it will be seen that in eleven out of the twenty-five the State was wholly unrepresented. In this number were included all the departments of art, metallurgy, agriculture and horticulture; stone, earthenware and glass; all small wares and fancy goods; paper and stationery; civil engineering and architecture; and interior household decoration and arrangement. In four of the fourteen groups in which it was represented at all, it had

single contributions. In five it had two ; in one it had three ; in one it had four ; in one, that of textile fabrics, it had seven ; in one other, that of machinery, it had seventeen. Our manufacturers of condensed food and preserved fruit and vegetables (Group IV.), exhibited two excellent examples, the one of canned articles, the other of cocoa and chocolate. Our engravers, book-printers, lithographers, photographers and decorators (Group. XII.) were represented by Prang's chromo-lithographs, which, with a solitary landscape-painting by Mr. C. Granville Way, of Boston, were the sole indications of progress in our artistic development. Our philosophical and surgical instruments (Group XIV.) were two models, the one of an "Hyperbolical Paraboloid," the other of an "Hyperboloid" and a "Hygrodiak." In the great field of chemical industries (Group III.), we were represented by some lubricating oil, some leather-dressing, and by the "Rising Sun Stove Polish."

It does not, of course, need to be said that no discrimination whatever had been exercised as regards a selection of exhibits in the case of the State, any more than in that of the nation, and in six only of the fourteen Groups in which she was represented, were the contributions such as to call for special commendation. Among the textiles (Group V.) were specimens of cassimeres, and of carpets of excellent quality produced in Massachusetts by Blackinton & Sons, of North Adams, and by the Bigelow Carpet Co., of Clinton, though forwarded by New York selling agents. Gardner, Brewer & Co. also exhibited some superior shirtings, though these again were manufactured in New Hampshire. In Group VII., the contribution of the Douglas Axe Co. was highly creditable. In Group VIII., A. S. Parks, of Winchendon, exhibited water-pails, manufactured on the spot, and B. F. Sturtevant, of Boston, some specimens of prepared wood for shoe-pegs, both of which exhibits received and deserved high commendation. In Group XV., our single contribution of musical instruments—for our great piano manufacturers were not represented—were some highly creditable organs, from the Mason & Hamlin Organ Co., of Boston ; and in Group XVI. the Smith & Wesson revolvers fairly represented our

progress in fire-arms. In machinery only, however, was the Massachusetts contribution otherwise than a ludicrous failure.

In this Group (XIII.), the American exhibits generally attracted attention, on account of their merit and novelty, and, though by no means the best specimens of our mechanical engineering, did not reflect discredit. An examination of the list of awards will show, that in proportion to its exhibitors, the United States received a larger number of high prizes than any other country. The reason for this is not that the jury were lax or partial in their decisions, but that nearly every one of our machines, when compared with those of foreign make, had some points of superiority.

Massachusetts was not wanting in contributing to this result. The wood-working machinery, the boot and shoe machinery and the wool-spinner were among the chief attractions of the Exposition, not only for the gazing crowd, but for experts; and for this reason, in an official report, the exhibits from the State in this department should receive more than a merely passing notice.

The collection of wood-working tools exhibited by Mr. B. D. Whitney, of Winchendon, without considering the novelties in design, were most creditable in point of construction, since they showed careful calculation and accurate workmanship, for lack of which American tools have been too often exposed to criticism. Mr. Whitney's pail-machinery was sent only to interest visitors, and not as a new invention. His saw-bench and short planer, which were at the Paris Exposition in 1867, were unsurpassed by any similar tools on exhibition. The scraping-machine, designed to smooth the surface of small pieces of hard-wood, such as are used in cabinet-making, was an entirely original invention. It performs its work quicker and far better than is possible by hand-labor. In order to secure the peculiar edge required on the scraping-knife, a special grinding-machine was provided, without which the utility of the scraper would be much lessened. There was also a jig-saw, balanced in a novel way, so that it could be run at a high speed without producing the trembling which usually attends the action of such machines. The most prominent of his exhibits, and the one which was brought into competition with those of nearly every manufacturer at the



Exposition, was the improved band-saw, in which he has accomplished two things, which are essential to its perfect working, viz. : a suitable surface for the back of the saw to rub against, and an automatic device to keep the tension of the saw-blade uniform.

The firm of Witherby, Rugg & Richardson, of Worcester, had a planing-machine for general work which possessed several advantages. In some way it was unfortunately injured in transit, so that its operation was rather imperfect.

The Knapp dovetailing machine, from Northampton, was in constant operation. It makes a form of dovetail which can be used whenever machine-dovetailing is admissible. For rapidity and accuracy of work it can hardly be excelled.

The continuous wool-spinner exhibited by Mr. J. G. Avery, of Spencer, was one of the most interesting exhibits in the hall. By a simple and ingenious device, a motion is attained in drawing out the roving and reducing it to yarn, which imitates that of the arm of a hand workman. As the material is drawn constantly from the spool, and continuously wound upon the bobbin, the capacity of the machine is at least double that of those now in use. There are in addition several small contrivances which greatly increase its efficiency.

The set of shoe-machinery was most complete of its kind, and the only one worthy of mention in the Exposition. During several hours in the day, workmen were engaged in making shoes, or in showing the operation of special machines. The pegging-machines, roller, sewing-machines and burnisher, from the Shoe Machinery Manufacturing Co. of Boston, were comparatively new. The "wire-nailer" was the more interesting, because the French showed a far inferior machine for the same work. The machines for making and attaching heels, sent by the Bigelow Heeling Machine Association, of Worcester, were exhibited for the first time. These machines make it possible to manufacture cheap heels from good or refuse stock, so that they will be as durable as when made in the ordinary way. There were also special devices for attaching and finishing heels. The attention paid to labor-saving contrivances and to strength in construction was noticeable. The enterprise of the representatives of this firm in persevering in the manufacture of shoes, although they were

not allowed to sell them, deserves commendation. A few shoe-machines, from T. A. Dodge, Cambridge—prominent among which was the well-known McKay sewing-machine—were brought in after the jury had finished its work, and therefore received no award.

There were no large iron-working tools from Massachusetts, a fact which is the more astonishing when the reputation of our manufacturers is considered. Among the shop-fittings was a parallel-jawed vise by Mr. Thomas Hall, of Northampton; one of a style peculiarly American, so contrived that the jaws can be rapidly pulled backward and forward, and almost instantly fastened on any interposed object. The Morse Twist Drill Co. showed a case of their increase-twist drills and fluted reamers. The hand-knitting machine, from the Lamb Knitting Machine Co., at Chicopee Falls, and the Excelsior Gas Machine from Warren, sustained their reputation as standard machines.

From this brief survey of the important Massachusetts mechanical exhibits, it will be seen that even in those departments which were best represented, we had but two or three exhibitors, and the majority of kinds were nearly or wholly unrepresented. The only mitigating consideration is, that what we did have was uniformly good, and carried away the highest honors.

In comparison with the other States of America, Massachusetts stood fourth in respect to the number of her contributions to the Exposition as a whole, being exceeded by New York, Ohio and Louisiana. Judged by the test of prizes awarded, the State stood second with Ohio in respect to their quality, being exceeded only by New York. A detailed list, both of the exhibitors from Massachusetts and of the prizes awarded them, will be found appended to this report. Of the fifty-five contributors from the State in fourteen groups, thirty-three received either prizes or honorable mention. Of these, however, the medals for progress and merit—the two highest awards, after the grand diplomas of honor—alone deserve any great degree of consideration, the others having been so widely distributed as to lose their significance. Of the sixty-four medals of progress awarded to Americans, Massachusetts received thirteen; and of the 156 medals of merit, she



received fifteen; being in all twenty-eight medals, as compared with seventy-eight received by the New York exhibitors, twenty-eight by those from Ohio, and seventeen by those from Pennsylvania. Four diplomas of honor were, however, awarded to individual American expositors, two of whom were from Pennsylvania, and one each from Rhode Island and from New York. The four individuals thus distinguished were, Messrs. Sellers, for machine tools, Corliss, for his steam-engine, White for dentistry, and Wood for the invention of the mowing-machine. It will be noticed that every State in the Union was represented by expositors, though no less than thirteen States numbered three or less. America was not, however, represented in all the groups. Nothing was contributed to Group XIX., which related to the arrangement and interior decoration of the private dwelling-house; or to Group XXII., which was devoted to showing the influence of museums of fine arts on industry; or to Group XXIV., which was made up of objects of fine arts of the past, exhibited by their owners. In Group XXV., in which were included the fine arts of the present time, produced since 1862, the American exposition was wretchedly and disgracefully inadequate. In Group XX., being the farm-house, its arrangements, furniture and utensils, Mr. F. H. Appleton, of West Peabody, furnished the solitary contribution, a modest plan of the farm owned and cultivated by him. In Group XXI., of national domestic industry, which included the superb potteries, porcelains, tapestries, laces, metal articles and carved work, which were the brilliant feature of the Exposition, the only American contributors were two young ladies, respectively from New York and Michigan, who sent, the one an "Embroidered Picture," and the other a "Phantom Bouquet." In Group XXIII., relating to art applied to religion, and which included the entire ornamentation of all sacred edifices, the American contributions were two in number, and both from New York, the one being a "Bronze Lectern," and the other an improved "Burial Casket."

Turning from the American department to the Exposition as a whole, the general field was as rich in material for special reports of value as the particular field was barren. A very cursory examination, however, of most of the col-

lections of public reports which have been made on previous Expositions supplies the means of forming a clear idea, both of the nature and value of these productions. As a rule they have added simply a heavy printing bill to the other expenses of representation. This experience the Massachusetts Commissioners felt no ambition to repeat. A general report of our own could easily have been compiled, which would have included, in a compendious form, much that has already appeared in the columns of the press. A large body of perfunctory reports of a similar character could also have been procured from others at a moderate cost. Neither of these methods of completing our work commended itself to our judgment. Very serious difficulties, however, presented themselves in the way of any systematic plan of reports calculated to be of real value. Two plans on which they might be prepared suggested themselves. The first looked to a comparison of results presented in the Vienna Exposition with those observed in the Expositions of London or of Paris. Such a comparison, properly instituted and developed by competent hands, should reveal more or less accurately the departments in which industry or art had made advances, or had retrograded, between the Expositions. Had it been within our power to develop this scheme of reports, the result could not but have been most instructive, as showing the hidden influences which had been and now were in operation in different countries. The conception was, however, too general, and pre-supposed a command of means and of agents altogether beyond the reach of a state commission. The other plan was calculated to be of more immediate interest to Massachusetts. A very brief study of the Exposition sufficed to show, that, so far as America was concerned, the articles contributed to it were divided by a broad line of demarcation into two classes. In one class were included the articles of practical utility, including especially all labor-saving appliances; in the other were those results of human skill, the production of which was due to a more educated hand or to a more developed artistic taste; which showed a finer touch or a more thorough technical training. As regards the first class of exhibits, revealing a ready resource and a great, though somewhat coarse, practical ingenuity, America, even

at Vienna, showed a sufficient degree of strength, and certainly seemed to call for no reports from public agents. It would indeed be little less than a display of folly for a body of state officials, with, at best, very general information, to undertake to instruct in the details of their business men managing interests, the annual product of which amounts to tens of millions of dollars. It is not to government reports that these men go for information. There was little probability that we could discover much that has escaped their search, even if they were not themselves on the ground in person, or by their representatives. It is not so, however, as regards the exhibits of the second class. No richer field of instruction for Massachusetts industry could have been desired than was presented at Vienna in the display of articles, the excellence of which lay in the nice skill or educated taste or thorough training of those who produced them. America was here immeasurably behind all leading competitors. After full consideration, therefore, it was determined to devote especial attention to securing detailed reports bearing upon the exhibits belonging to this class, and to confine the reports relating to machinery and labor-saving inventions within very general limits. A comprehensive schedule was accordingly prepared, and it remained only to secure the services of the specialists competent to develop its several parts. But here again was encountered the great obstacle of an imperfect organization. Our scheme included some thirty papers on various subjects, a special prominence being given to the exhibits in Group XXII., described in the official catalogue as that part of the exhibition showing the organization and influence of museums of fine art as applied to industry,—to which group, it will be remembered, not a single contribution was made by America. We further desired to procure more or less thorough and authoritative information on the recent developments in the production of pottery, porcelain and the ceramic arts generally,—in which this Exposition was wonderfully rich,—on gold and silver wares; embroideries and fine textile fabrics; on paintings, bronzes, statuary and engravings; on glass and on manufactures of ivory, of paper and of leather. A body of reports, some twenty in number, were promised us, all of which, we

believe, are of value, and many of which have already been completed, and are now in our hands ready for publication. As a whole, however, the design could not be carried out. The cause of our failure to do all that we hoped to do in this respect, I shall hereafter refer to more fully. At present it is sufficient to say that we had relied upon finding at Vienna, upon the juries, in the national commission, or among the Americans drawn thither by the Exposition, many who were interested in specialties, and from whom suggestions and even reports might be procured. A few such there were, and to them we owe those portions of the general plan of our reports which we succeeded in procuring. The result, however, constitutes at best but a series of fragments. As a rule, the material we had to work with was of the most discouraging description, from which no results worthy of preservation could be expected. Even where men of character and knowledge were found, in the great majority of cases they were either so disgusted with the disrepute into which America and Americans had fallen, that they refused to assume any labor in connection with the Exposition, or they remained at Vienna merely long enough to get an idea of what the Exposition contained, and then dismissed the whole subject as rapidly as possible from their minds. Two examples will illustrate the disappointments the Commissioners had to encounter in this respect. The production of paper and glass is among the most promising industries of Massachusetts, and admits of great development. In both, the Vienna Exposition was peculiarly rich; and to the manufactured results of both artistic taste and technical skill have of late years contributed a greatly increased value. In spite of the most careful inquiry, however, we were unable to discover any one possessing a knowledge of the growth or present condition of these industries in Massachusetts, who would undertake to furnish a paper upon them. A formal and superficial report could of course have been procured with little trouble and at small expense. It was not, however, deemed advisable in securing the requisite quantity of reports to evince a too complete disregard of their quality.

Under these circumstances, long before the labors of the Commission were brought to a close, the fact of a practical

failure in our mission had become very evident to me. The failure was due to either of two causes—to the defective organization of the Commission at home, or to the absence of the material necessary for it to work with at Vienna. The Commission had not been selected with a view to its being complete in itself, and it failed to secure outside of itself the assistance necessary to carry out any broad plan of general review. Whatever the cause, however, and whether personally responsible for it or not, I early concluded that there was but one course to be pursued. The fact of failure must be met squarely, and in this way only could it be converted into a success. Instead of attempting to silently ignore the unsatisfactory results of our mission, or to conceal them under a cloud of perfunctory platitudes, it seemed to me our duty to state them with all possible precision of language, to the end that the Commonwealth might derive from our experience the most definite conclusions for its future guidance. For to me it is very clear that the Vienna Exposition is not destined to be the last of its kind. Whether financially it proved a success or a failure is matter of small moment, so far as the continuance of the great succession of international fairs is concerned. They constitute a part of the machinery of modern development. As mere bazaars of the nations, if as nothing else, they are destined to an indefinite repetition; for as sensational sales-rooms they are profitable. Others will then hereafter take place in which it will be well for Massachusetts to take her part. Many and obvious reasons will render such a course advisable. The people of Massachusetts form a community, the whole future prosperity of which depends upon its maintaining a superiority over others in matters of education, of ingenuity and of skill. The figures of the census are significant of coming danger in these respects. Our people will have to follow the path which others have trodden before, and consent to accept lessons from all who can teach them. We, no less than the people of England, of France and of Austria can learn much in these great industrial arenas, where our products will be brought in contact and comparison with those of other communities before our own eyes and those of the world. The State itself, also, as an educator, may derive most useful les-

sons from the experience ; for here in America we are at best too far removed from what are still and will long remain the great models of art and the most thorough systems of instruction. If, however, the State is to take her part with other civilized communities in these tests of relative development, it is a matter of no small import that she should appear in a manner not unworthy of herself. If this could hereafter be secured, it would be perhaps the best and richest result possible to be derived from her own and the nation's experience at Vienna. In no event, however, should that experience be repeated. That it may not be repeated, it is proper that the truth in regard to it should be told, even though it prove somewhat unpalatable. In doing this, it will be necessary for me to refer to the national representation and that of other States as well as of Massachusetts, though no individual application belongs to any of my remarks.

A nation or a community in entering upon the competition of a world's fair must have one or both of two objects in view ; it must go there to exhibit, or it must go there to observe. In going there, however, for the one object or the other, or for the two combined, there is, after the experience we now have of such undertakings, no possible excuse for any people in going so unprepared or so represented as to either fail in accomplishing the objects it has in view, or to humiliate itself and its citizens in the eyes of those with whom it proposes to compete. Whether to exhibit or to observe, however, it is not too much to say that the entire arrangement of the American organization at Vienna, both state and national, was an utter, entire and disgraceful failure ; a failure in conception and a failure in execution ; a failure unjust to our industries, discreditable to the country and humiliating to those more immediately concerned. To us representing the State upon the spot, it was painful to think of what the Massachusetts exposition might easily have been made,—most mortifying to see what it was. A better opportunity to achieve a great and brilliant success in the eyes of all civilized nations was never offered to any community than was lost by the Commonwealth at Vienna. It was lost simply from the fact that the State as such undertook to participate without previously having any definite idea either as to what it proposed



to do, or how it proposed to do it. The means appropriated to the end were ample; the matured design was wanting. In this and in every similar case all depends upon thoroughness of preparation. The course which should have been pursued is now perfectly apparent. The legislative action taken in February, 1873, should have been taken in February, 1872, and the Commissioners who were to carry the design into execution should then immediately have been selected. By them the State should have been thoroughly canvassed and its industries marshalled; those best representing its products should have been interested in the scheme, and their contributions collected and shipped, while the agents of the Commonwealth should have been upon the ground to receive them as early as January, 1873. Had this been done, no one at all familiar with the resources and results of her industry can for an instant doubt that the triumph of Massachusetts would have been as conspicuous as was the failure of the United States; the state would have redeemed the credit of the nation. It is idle to regret an opportunity lost, but, in future, it will be for Massachusetts to remember that it is better, much better, not to appear at all, than unworthily to exhibit herself at a world's fair. A worthy appearance cannot be improvised; it implies labor, prevision and experience. Money even is less necessary than organization; unless this last is provided, both the state and its citizens had best stay at home.

All this, however, related merely to the Exposition as a mart,—to the sales-room only into which all countries brought their choicest products in competition with each other. But a no less pointed lesson of experience can be drawn from the manner in which we approach the Exposition as a school. It was not possible to look at the amazing results of science and skill there displayed, and not be impressed with the inexhaustible wealth of suggestion they contained for any American community. There is probably no other people which could draw so many benefits from it. But to secure those benefits it was necessary that the displayed, and yet more the hidden resources of the Exposition should be studied and developed by men who were masters of their subjects. As a rule, however, the men selected officially to represent

America were even less creditable to the country than were the wares. It would convey a wholly erroneous impression to say that among the many Americans present during the Exposition, and occupying more or less official relations with it, there were not some competent to fill the positions in which they found themselves placed. It was, however, a melancholy fact that this was the exception and not the rule. The various organizations, as a whole, were the furthest possible from what they should have been. This criticism applied to all, from the commission of the United States down through those of the several States, and to our representatives on the juries. I have already sufficiently referred to the strenuous and very partially successful efforts made to discover the material which would enable us to carry out the plan of special reports which we had conceived. As a rule, our researches brought to light only a noticeable absence both of education and of a thorough practical knowledge of specialties. It surely should be a fair matter for presumption, that individuals selected to represent America upon international juries, which are to pass upon the relative excellence of the best results of the industries of all civilized countries, would know *something*. In far too many instances, those Americans who were appointed to this honorable function at Vienna seemed to fail as regards this elementary pre-requisite. It was thus no unusual circumstance to find an individual holding the position of a judge, whose ignorance of the subject-matter under discussion was only surpassed by his ignorance of the language in which the discussion was necessarily conducted. Certain men there were upon the juries amply competent to fill any position,—men of education, at home in the languages and thoroughly versed in their specialties. These, however, constituted brilliant exceptions to the general rule of incompetence. As a whole, the American official representation was a curious and instructive commentary in the eyes of all other countries of both hemispheres upon our national system of appointment to office. Previous qualification for the performance of duties had apparently not been regarded as requisite. There accordingly had flocked to Vienna a motley accumulation of nondescripts, the highest general ambition among whom appeared to be a mention in reportorial paragraphs,—newspaper



celebrities in matters of education, of science and of art. It was indeed matter of curious observation how very rarely the names of the true scientific authorities—those on the spot recognized as such—were ever mentioned; and what frequent and noisy reference was made to others whose efforts were least appreciated by those most competent to judge of their worth. There were also in attendance a large number of others occupying positions more or less official, whose presence it was not easy to explain. They had certainly not been commissioned on account of any public service they were qualified to render, and it was difficult to appreciate the exact amount of private benefit they were deriving from their sojourn. They certainly knew nothing, and to all appearances they did nothing. They had apparently secured appointments abroad as an agreeable change from a monotonous and dreary idleness at home. These, however, were at least a negative element,—they were unnoticeable units in a vast aggregation of men. This could not, however, truthfully be said of all. There were those among accredited representatives,—especially “Honorary Commissioners” of certain of the States,—who reflected a direct discredit upon those by whom they were sent, and whom they were supposed to represent. Individuals who could have received public credentials to the Exposition for no conceivable reason except that they wished to see it, or had some less creditable ends in view, and regarded a governmental commission as a species of letter of credit.

It surely need not be said that such a gathering as this is not one from which it is easy to procure complete or philosophical *résumés* of the results of modern progress. That we succeeded in securing so many as we did, is now somewhat of a matter of surprise to me. The lesson to be derived from this portion of our experience is, however, an obvious one. So far as studying results upon any general or comprehensive plan of value is concerned, I am persuaded that it is useless for Massachusetts or for any other individual State to send its agents to future Expositions. It is in fact a mere waste of public money. The end is out of all proportion to the means. The material to be met with on the spot is not sufficiently good or reliable, and the field of operations is too remote to justify the great expense which must of neces-

sity be incurred in selecting and sending to it a complete corps of specialists. The national government only could undertake the task; and the experiences of the past do not justify any confident expectations for the future from that quarter. Should Massachusetts or any other state conclude, therefore, on any future occasion, that results of general importance to its people could be derived from a careful study of the exhibits in a world's fair, it must abstain from attempting too much. The public press furnishes everything of a general and superficial character that any state commissioner could procure. The art of "cramming" is by it carried to perfection. Beyond this, however, a real want exists of exhaustive studies in special departments. These, state commissioners, if selected for that purpose, could supply better than any other agency. Take, for instance, the great branch of technical and artistic education which has already been referred to. It has of late years undergone a surprising development in Europe, the results of which supplied its most interesting and instructive feature to the recent Exposition. It is now exciting the greatest interest among all thoughtful men in America, and promises infinite results in our immediate future. The Massachusetts commission might well have been organized with a single view to dealing thoroughly with this department. Had it been so organized, the end in view would have been strictly proportioned to the means at command. To me, personally, from an early period after my arrival at Vienna, it has been a cause of deep regret that this view of the subject was not earlier taken. The experience came, however, too late, and it only remains to see that it is not again repeated.

Meanwhile the American Centennial must now be prepared for. It is greatly to be regretted that those who are to represent the Commonwealth there should not also have represented it, as was the original design, at Vienna; the experience would have been invaluable. Meanwhile, if the results of the Vienna Commission can be made to contribute to the successful participation of the State in the Centennial, the expense incurred in sending it out will prove a most fortunate outlay. The desired result can be secured in a very simple way. A timely organization must be effected. The work of

preparing the contributions of any community for their proper display in an international exposition is now a profession in itself, which, among European nations, has been carried to a high degree of development. Almost every foreign government which participates has, among its agents, men whose experience dates back to the Prince Albert original of 1851, and who know just what ought to be done and exactly how to do it. The organization effected by these men is as perfect as experience and familiarity with the work can make it. No progress in this direction has as yet been made in America. At Vienna, our authorities showed an utter inability to appreciate either the magnitude and complexity of the undertaking, or the labor and devotion necessary to bring it to a successful issue. In our own failure, we both happily and forcibly illustrated almost every conceivable blunder which a people could commit; while the course which ought to have been pursued was clearly indicated through the success of others.

The work of preparation for 1876 cannot commence too soon in the several States. It should have commenced already. The legislature now in session ought at once to decide upon the course which Massachusetts as a state proposes to take. If it decide to do nothing, then that decision should be final, and should on no account hereafter be reversed at a moment so late that action will be synonymous with failure. If, on the contrary, it is decided to enter into the affair with a local organization, the necessary provision for it should then immediately be made. Under no circumstances should our action be marked by hesitation, or by that tardiness which rendered barren the mission to Vienna. No action at all is better than action after the opportunity is lost. The simplest organization is the best, and to be efficient should be inexpensive. No cumbrous system of salaried commissioners, or of honorary commissioners with perquisites, is either necessary or desirable. Those who are to represent the State have already been designated. So far as any state organization, as such, is concerned, their duties should be merely advisory; or, if it is thought proper or desirable to create another commission, then those appointed upon it should act simply as a board of unpaid trustees or directors, performing no executive duties themselves, but

supervising, counselling or authorizing the steps taken by him upon whom responsibility must finally rest. Their function is an ornamental, and yet a most important, one; they are to lend weight and character and authority to the occasion; their names should inspire that faith and confidence in the undertaking without which success is not possible. To carry out the work of detail, upon which everything depends, a single secretary to the commissioners should be appointed, who should be the executive officer in charge. He should receive an adequate salary, and for the next three years his whole time and thought should be devoted to the success of the Massachusetts department. With the ordering of the affair as a whole, he would have no connection; his duties would relate simply and solely to the share of his own state. No ordinary or inexperienced man could fulfil the duties of the position, for it is a great error to suppose that it is one either of holiday-work or newspaper renown. On the contrary, these incidents of the exposition business are for others, while only the dry, repulsive, tedious labor of organization and of detail falls to the lot of the executive subordinate. Upon this subject many useful suggestions will be found in a valuable paper supplied to us by Prof. Thomas C. Archer, of Edinburgh, the managing head of the museum at that place, whose long experience qualifies him to speak with the highest degree of authority. This report was procured with a view to its bearing on the Centennial Exposition, and is ready, with others, for immediate publication, should the legislature so order. Meanwhile, as a practical example in point, the English commission at Vienna was probably as good an illustration as could be found. The means placed by the government at its disposal were small, but the results accomplished were all that could be desired. No department was better or more thoroughly organized than the British. The Prince of Wales was the president of the commission, which included fourteen other persons, all of the highest rank, or men well known from their connection with business, science or art. These constituted a species of board of direction, or of trustees, acting, of course, without pay. The secretary of the commission was Mr. Owen, of the South Kensington Museum; and upon him, assisted by a small but

very efficient staff of his own selection, devolved the whole responsibility and labor of execution. Mr. Owen was a very perfect illustration of what the "one-man power" ought to be, to which should be confided the work of organizing a national department in a universal exposition. Naturally gifted with remarkable executive powers, he brought to his work a long experience and a great capacity for silent labor. He fully appreciated the magnitude and importance of his task, and devoted himself wholly and unreservedly to it. He knew perfectly well, both what had to be done, and how to go to work to do it. To him, therefore, was mainly due the very remarkable success of the British display. In him a competent agent had been secured, and he was not trammelled.

If Massachusetts is to be properly represented at Philadelphia, the work of organization should, with as little delay as possible, be entrusted to a similar agent. It would then be for him to acquaint himself thoroughly with the industries, science and art of the State, and to put himself in correspondence with those most willing and competent to represent them. It would devolve upon him to see that the plan of representation was perfect in all its parts; and to be assured of this he must acquaint himself with the experience of other expositions. Such a labor requires high qualities of patience, industry, thorough education, and, above all, great powers of organization. It calls for a familiar acquaintance with all that Massachusetts has done, and with what she is now doing. To procure such an agent may not be easy, but unless he is procured, and that in good time, the legislature can rest assured that, as respects confusion, waste of money, and poverty of result, the experience of Massachusetts at Philadelphia will be but a repetition on a small scale of that of the United States at Vienna. The idea that such an undertaking can be brought to a successful result, either through the action of any committee, or by means of melifluous oratory, enthusiastic rallies and patriotic appeals, is wholly deceptive. It absolutely requires perfect concentration, silent work and exclusive devotion.

There is good reason to believe that every condition exists necessary to make a decided success of the proposed Philadelphia Centennial. The court pageant, which has played so brill-

iant and essential a part in its great European prototypes will, it is true, necessarily be wanting. The mercantile element, however, which has proved the great main-spring of all recent expositions, will there be present in a more than ordinary degree. Throughout the civilized world America is known as a great market; as a market in which fabulous prices are paid, especially for those things which are rich or rare. Accordingly, all the leading producers of the world, whether of objects of utility or of art, will wish to be represented. They will come with every conceivable product of human skill, and, more especially, with those a familiarity with which is in itself a liberal education, and the production of which offers well-nigh unlimited fields for American development. The zeal and public spirit with which the city and state most immediately concerned have thrown themselves into the undertaking have been most creditable, and, unaided, should suffice to secure the happiest results. All that is needed is a thorough concentration, economy and direction of force. The vulgar ambition of unprecedented bigness should be made to yield to an educated appreciation of excellence. There can be no question that the devotion of those who have the Centennial in charge will create in it a wide-spread and sufficing interest. Mismanagement, arising from ignorance, incompetence and jobbery,—a repetition of the Vienna experience,—will be the great danger to be apprehended. If that experience can now be turned to an immediate profit in preventing its own recurrence, we shall have some cause not wholly to deplore it. This, however, can only come from action, both intelligent and prompt, on the part of the various state governments, who will be the leading participants. Should this be deferred to the last moment, and then hastily improvised, those who rashly implicate themselves will probably have as good ultimate cause for regret as did the vast majority of their countrymen, who, during the last summer, found themselves in any way officially connected with the national fiasco at Vienna.

CHARLES FRANCIS ADAMS, JR.

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TABLES OF EXHIBITS, Etc.

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## RESOLVES

## CONCERNING THE UNIVERSAL EXPOSITION AT VIENNA.

*Resolved*, That the governor, with the advice and consent of the council, is authorized to appoint a citizen of this Commonwealth and such associates as may be necessary, to visit the Universal Exposition at Vienna, to assist the contributors from this State, to examine the various industries, manufactures and economies which may be exhibited or presented, and to report thereon to the legislature of eighteen hundred and seventy-four.

*Resolved*, That there be appropriated, to be paid out of the treasury, such a sum, not exceeding twelve thousand dollars, as the governor and council may deem necessary to carry into effect the provisions of the foregoing resolve.

*Resolved*, That there be appropriated, to be paid out of the treasury, a sum not exceeding three thousand dollars, to be expended under the direction of the governor and council, for the purpose of aiding in the proper representation at the Exposition of our system of education, and of obtaining therefrom information for the promotion of our educational interests.

*Approved March 3, 1873.*

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LETTER OF INSTRUCTION.

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## COMMONWEALTH OF MASSACHUSETTS.

EXECUTIVE DEPARTMENT, BOSTON, April 10th, 1873.

MY DEAR SIR:—The duties of the representatives from this State to the Vienna Exposition are specified in the Resolve authorizing their appointment, and the language of that Resolve is quoted in the commissions given you and your associates under the seal of the Commonwealth. The general direction of the Commission is en-



trusted to your discretion and judgment, and it is not doubted that you will find your associates ready to accord cheerful coöperation, to the end that the largest and most valuable results may be obtained. The Commission will be expected to do what it properly can to promote the interests of contributors from this State to the Exposition, and afford them such reasonable assistance as may be necessary in securing opportunity for the fair display and examination of their works. The appropriation made by the legislature will be subject to your order as the head of the Commission, and no bills for expenses incurred will be allowed except such as have your approval, the intent of the governor and council being to put the financial management of the Commission in your hands. You are expected to settle the reasonable necessary expenses of yourself and the associate commissioners now in this country in going to and returning from Vienna by the ordinary and most feasible route, as well as those of the associates now in Europe in travelling from points not further distant from Vienna than Paris or Antwerp. You are also expected to settle the reasonable necessary expenses of yourself and associates while in Vienna, for such a period of time as you may judge it advisable to remain there, keeping in mind that the object of the State in authorizing the Commission is specifically to secure practical information at the Exposition for the benefit of our people. Authority is given you to employ such assistance in Vienna as you may deem it advisable to procure in carrying out this object, and for that assistance you will make payment at a fair rate of compensation, taking receipts that may be filed with your accounts as vouchers. And of all matters involving the expenditure of money, you will be expected to render an account as soon as possible after your return.

Very truly yours,

W. B. WASHBURN,

*Governor of the Commonwealth.*

Hon. CHAS. FRANCIS ADAMS, Jr., Boston, Mass.

No. 1.—Table of American Exhibits, showing the Groups to which they severally belong, and the Medals or Diplomas of each description awarded to them.

GROUP.		Number of Exhibits.	Diploma of Honor.	Medal of Progress.	Medal of Merit.	Diploma of Merit.	Medal for Fine Arts.	Medal for Good Taste.	Medal for Co-operators.	Total Awards.
I.	Mining, Quarrying and Metallurgy, . . . . .	36	—	1	9	4	—	—	1	15
II.	Agriculture, Horticulture and Forestry, . . . . .	42	—	1	3	5	—	—	—	9
III.	Chemical Industry, . . . . .	41	—	—	19	10	—	—	—	29
IV.	Substances of Food as Products of Industry, . . . . .	69	—	9	25	17	—	—	—	51
V.	Textile Industry and Clothing, . . . . .	34	—	2	20	5	—	—	—	27
VI.	Leather and India-rubber Industry, . . . . .	25	—	1	4	10	—	—	—	15
VII.	Metal Industry, . . . . .	53	—	1	7	16	—	—	—	24
VIII.	Wood Industry, . . . . .	13	—	2	4	1	—	—	—	7
IX.	Stone, Earthenware and Glass Industry, . . . . .	19	—	—	1	2	—	—	—	3
X.	Small Ware and Fancy Goods, . . . . .	10	—	—	1	1	—	—	—	2
XI.	Paper Industry and Stationery, . . . . .	17	—	2	8	5	—	—	—	15
XII.	Graphic Arts and Industrial Drawing, . . . . .	36	—	6	10	7	—	3	2	28

XIII.	General and Agricultural Machinery, . . . . .	151	3	33	29	25	—	—	18	108
XIV.	Philosophical Surgical Instruments, . . . . .	31	1	2	1	3	—	2	—	9
XV.	Musical Instruments, . . . . .	6	—	2	—	2	—	—	—	4
XVI.	The Art of War, . . . . .	16	—	1	11	—	—	—	—	12
XVII.	The Navy, . . . . .	8	1	—	2	2	—	—	—	5
XVIII.	Civil Engineering, Public Works and Architecture, . . . . .	15	—	1	2	6	—	—	—	9
XX.	The Farm-house, its Arrangements, Furniture and Utensils, . . . . .	1	—	—	—	—	—	—	—	—
XXI.	National Domestic Industry, . . . . .	2	—	—	—	1	—	—	—	1
XXIII.	Art applied to Religion, . . . . .	2	—	—	—	—	—	—	—	—
XXV.	Fine Arts of the Present Time, . . . . .	16	—	—	—	—	2	—	—	2
	Total, . . . . .	643	5	64	156	122	2	5	21	375

Total awards for exhibited objects, . . . . . 349

No. 2.—*Table of Massachusetts Exhibits, with the Groups to which they severally belonged, and the Medals or Diplomas of each description awarded to them.*

GROUP.		Number of Exhibits.	Medal of Progress.	Medal of Merit.	Diploma of Merit.	Medal for Co-operators.	Total Awards.
I.	Mining, Quarrying and Metallurgy, . . . . .	1	1	1	1	1	1
II.	Agriculture, Horticulture and Forestry, . . . . .	1	1	1	1	1	1
III.	Chemical Industry, . . . . .	4	1	1	1	1	2
IV.	Substances of Food as Products of Industry, . . . . .	2	1	2	1	1	2
V.	Textile Industry and Clothing, . . . . .	7	2	3	1	1	5
VI.	Leather and India-rubber Industry, . . . . .	2	1	1	1	1	1
VII.	Metal Industry, . . . . .	10	1	1	3	1	4
VIII.	Wood Industry, . . . . .	2	1	1	1	1	2
IX.	Stone, Earthenware and Glass Industry, . . . . .	1	1	1	1	1	1
X.	Small Ware and Fancy Goods, . . . . .	1	1	1	1	1	1
XI.	Paper Industry and Stationery, . . . . .	1	1	1	1	1	1
XII.	Graphic Arts and Industrial Drawing, . . . . .	1	1	1	1	1	1

	17	7	4	1	.1	13
XIII. General and Agricultural Machinery, . . . . .						
XIV. Philosophical Surgical Instruments, . . . . .	2	—	—	—	—	—
XV. Musical Instruments, . . . . .	1	1	—	—	—	1
XVI. The Art of War, . . . . .	3	1	3	—	—	4
XVII. The Navy, . . . . .	—	—	—	—	—	—
XVIII. Civil Engineering, Public Works and Architecture, . . . . .	2	—	—	—	—	—
XX. The Farm-house, . . . . .	1	—	—	—	—	—
XXI. National Domestic Industry, . . . . .	—	—	—	—	—	—
XXIII. Art applied to Religion, . . . . .	—	—	—	—	—	—
XXV. Fine Arts of the Present Time, . . . . .	1	—	—	—	—	—
Total, . . . . .	55	13	15	5	1	34
Total awards for exhibited objects, . . . . .						33

No. 3.—Table showing the Contributions of each of the several States of the Union to each of the Groups.

GROUP.	Alabama.	California.	Colorado.	Connecticut.	Dist. Columbia.	Georgia.	Illinois.	Indiana.	Kansas.	Kentucky.	Louisiana.	Maine.	Massachusetts.	Maryland.	Michigan.	Missouri.
I. Mining, Quarrying and Metallurgy, . . .	—	1	2	—	—	—	2	1	—	—	3	—	—	—	1	7
II. Agriculture, Horticulture and Forestry, . . .	2	1	—	—	—	—	—	1	—	—	19	—	—	—	—	6
III. Chemical Industry, . . . . .	—	—	—	—	—	—	2	—	—	1	3	—	4	—	—	1
IV. Substances of Food as Products of Industry, . . .	—	3	—	—	—	—	1	1	—	1	19	1	2	—	—	9
V. Textile Industry and Clothing, . . . . .	—	—	—	—	1	—	1	—	—	—	3	—	7	1	—	2
VI. Leather and India-rubber Industry, . . . . .	—	—	—	—	—	—	—	—	—	2	1	—	2	1	—	1
VII. Metal Industry, . . . . .	—	—	—	4	1	—	2	—	1	—	1	—	10	—	—	—
VIII. Wood Industry, . . . . .	—	—	—	1	—	—	—	—	—	—	1	—	2	—	—	—
IX. Stone, Earthenware and Glass Industry, . . . . .	—	1	—	—	—	—	1	—	—	1	—	—	—	—	—	2
X. Small Ware and Fancy Goods, . . . . .	—	—	—	1	—	—	—	—	—	—	2	—	—	—	—	1
XI. Paper Industry and Stationery, . . . . .	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	1
XII. Graphic Arts and Industrial Drawing, . . . . .	—	3	—	—	1	—	2	—	—	—	4	—	1	—	—	2

XIII.	General and Agricultural Machinery, . . .	—	—	—	14	—	—	8	1	1	—	2	—	17	2	—	—
XIV.	Philosophical Surgical Instruments, . . .	—	—	—	1	—	1	—	1	—	—	5	—	2	—	—	—
XV.	Musical Instruments, . . .	—	—	—	—	—	—	—	—	—	1	—	—	1	—	—	1
XVI.	The Art of War, . . .	—	—	—	2	—	—	—	—	—	1	—	—	3	—	—	—
XVII.	The Navy, . . .	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—
XVIII.	Civil Engineering, Public Works and Architecture, . . .	—	—	—	—	1	—	—	—	—	1	1	—	2	—	—	—
XX.	The Farm-house, . . .	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—
XXI.	National Domestic Industry, . . .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—
XXIII.	Art applied to Religion, . . .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
XXV.	Fine Art of the Present Time, . . .	—	—	—	—	1	—	1	—	—	—	—	—	1	—	—	—
	Total, . . .	2	9	2	23	6	1	20	5	2	8	65	1	55	4	2	33





XIII.	General and Agricultural Machinery, . . .	—	—	58	4	1	23	8	6	—	—	—	1	1	—	4	151
XIV.	Philosophical Surgical Instruments, . . .	—	—	11	1	—	3	5	1	—	—	—	—	—	—	—	31
XV.	Musical Instruments, . . .	—	—	2	—	—	—	—	—	—	—	—	—	1	—	—	6
XVI.	The Art of War, . . .	—	—	5	—	—	—	2	1	1	—	—	—	—	—	1	16
XVII.	The Navy, . . .	—	—	5	—	—	—	—	—	—	—	—	—	—	—	2	8
XVIII.	Civil Engineering, Public Works and Architecture, . . .	—	—	7	—	—	1	1	—	—	—	—	—	—	—	1	15
XX.	The Farm-house, . . .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
XXI.	National Domestic Industry, . . .	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	2
XXIII.	Art applied to Religion, . . .	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	2
XXV.	Fine Arts of the Present Time, . . .	—	—	6	—	—	4	2	1	—	—	—	—	—	—	—	16
	Total, . . .	3	1	216	15	1	86	43	12	3	1	2	1	9	2	10	643

No. 4.—*Table showing the Diplomas or Medals awarded to the Exhibits of the several States in each of the Groups.*

STATE.	Number of Exhibits.	Diploma of Honor.	Medal of Progress.	Medal of Merit.	Diploma of Merit.	Medal for Fine Arts.	Medal for Good Taste.	Medal for Co-operators.	Total Awards.	Awards for Exhibited Objects.
Alabama, . . . . .	2	—	—	1	—	—	—	—	1	1
California, . . . . .	9	—	5	4	—	—	—	—	9	9
Colorado, . . . . .	2	—	—	—	—	—	—	—	—	—
Connecticut, . . . . .	23	—	4	9	6	—	—	3	22	19
District of Columbia, . . . . .	6	1	—	1	1	—	—	—	3	3
Georgia, . . . . .	1	—	—	—	—	—	—	—	—	—
Illinois, . . . . .	20	—	—	6	6	—	—	—	12	12
Indiana, . . . . .	5	—	—	2	1	—	—	1	4	3
Kansas, . . . . .	2	—	—	—	—	—	—	—	—	—
Kentucky, . . . . .	8	—	—	2	3	—	—	—	5	5
Louisiana, . . . . .	65	—	2	9	7	—	—	—	18	18
Maine, . . . . .	1	—	—	1	—	—	—	—	1	1
Massachusetts, . . . . .	55	—	13	15	5	—	—	1	34	33
Maryland, . . . . .	4	—	—	1	2	—	—	—	3	3
Michigan, . . . . .	2	—	—	—	1	—	—	—	1	1
Missouri, . . . . .	33	—	1	4	4	—	—	—	9	9
Mississippi, . . . . .	3	—	—	—	1	—	—	—	1	1
Nevada, . . . . .	1	—	—	1	—	—	—	—	1	1
New York, . . . . .	216	1	23	55	56	1	4	9	149	136
New Jersey, . . . . .	15	—	2	3	6	—	—	—	11	11
North Carolina, . . . . .	1	—	—	—	—	—	—	—	—	—
Ohio, . . . . .	86	—	7	21	10	—	1	7	46	38
Pennsylvania, . . . . .	43	2	4	13	6	—	—	—	25	25
Rhode Island, . . . . .	12	1	2	4	2	—	—	—	9	9
Tennessee, . . . . .	3	—	—	1	—	—	—	—	1	1
Texas, . . . . .	1	—	—	1	—	—	—	—	1	1
Virginia, . . . . .	2	—	—	—	—	—	—	—	—	—
West Virginia, . . . . .	1	—	—	—	—	—	—	—	—	—
Vermont, . . . . .	9	—	—	—	1	—	—	—	1	1
Wisconsin, . . . . .	2	—	—	1	2	—	—	—	3	3
Miscellaneous, . . . . .	10	—	1	1	2	1	—	—	5	5
Total, . . . . .	643	5	64	156	122	2	5	21	375	349

No. 5.—Table showing the Number of Establishments engaged in each of thirty-two of the Leading Industries of Massachusetts, as reported in the United States Census for 1870, and the total value of their Annual Production, with the Number of Exhibits contributed by each to the Vienna Exposition.

Number.	KIND OF INDUSTRY.	Number of Establishments.	Value of Products.	Number of Exhibitors.
1	Boots and Shoes, . . . . .	1,123	\$86,565,445	3
2	Cars, . . . . .	6	2,408,827	—
3	Carriages, . . . . .	326	4,038,656	—
4	Buttons, . . . . .	9	511,175	—
5	Agricultural Implements, . . . . .	37	1,033,590	—
6	Cutlery, . . . . .	12	1,617,904	—
7	Cotton Goods, . . . . .	191	44,832,375	1
8	Fire-arms, . . . . .	12	865,481	3
9	Furniture, . . . . .	324	11,522,448	—
10	Drugs and Chemicals, . . . . .	22	1,800,399	—
11	Edgetools and Axes, . . . . .	12	969,224	1
12	Glassware and Window Glass, . . . . .	14	2,371,000	—
13	India-rubber Goods, . . . . .	32	3,183,218	1
14	Instruments, Prof. and Scientific, . . . . .	12	328,800	2
15	Leather, . . . . .	138	9,984,497	2
16	Machinery, . . . . .	346	18,354,052	17
17	Men's Clothing, . . . . .	446	20,212,407	—
18	Musical Instruments, . . . . .	60	4,453,794	1
19	Paper, . . . . .	95	12,677,481	—
20	Jewelry, . . . . .	59	2,342,025	—
21	Prints, . . . . .	11	17,325,150	—
22	Paper Collars, . . . . .	9	997,000	—
23	Saddlery and Harness, . . . . .	247	1,503,994	—
24	Plated Ware, . . . . .	37	1,012,100	—
25	Nails and Tacks, . . . . .	43	5,285,244	3
26	Straw Goods, . . . . .	14	4,869,514	—
27	Watches, . . . . .	3	1,281,160	—
28	Whips and Canes, . . . . .	38	604,367	—
29	Wire, . . . . .	6	2,354,672	—
30	Woodenware, . . . . .	25	538,402	1
31	Wooden Goods, . . . . .	182	39,489,242	2
32	Worsted Goods, . . . . .	35	8,280,541	—
	Totals, . . . . .	3,796	\$313,514,184	37

## LIST OF MASSACHUSETTS EXHIBITORS.

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### GROUP I.

#### MINING, QUARRYING AND METALLURGY.

No Exhibits.

### GROUP II.

#### AGRICULTURE, HORTICULTURE AND FORESTRY.

No Exhibits.

### GROUP III.

#### CHEMICAL INDUSTRY.

1. Morse Bros., . . . . Canton, . . . Stove Polish.
2. Hauthaway & Sons, . . . Boston, . . . Leather Dressings.
3. Nye, W. F., . . . . New Bedford, . Oils.

### GROUP IV.

#### SUBSTANCES OF FOOD AS PRODUCTS OF INDUSTRY.

1. Underwood, Wm., & Co., . . Boston, . . Canned Articles.
2. Baker, Walter, & Co., . . Boston, . . Chocolate and Cocoa.

### GROUP V.

#### TEXTILE INDUSTRY AND CLOTHING.

1. Blackinton, S., & Sons, . . N. Adams, . Cassimeres.  
Exhibited by Pomeroy & Plummer, New York.
2. Bigelow Carpet Co., . . Clinton, . Carpets.  
Exhibited by W. & J. Sloane, New York.
3. Brewer, Gardner, & Co., . . Boston, . Shirtings.
4. Schayer Brothers, . . . Boston, . Boots and Shoes.  
(See Group VI.)
5. Neil, Mrs. J. G., . . . Cambridge, . Feather Wreath.
6. Lilly, Young, Pratt & Brackett, Lynn, . Shoes.
7. Walker, J. H. & G. M., . . Worcester, . Boots.

## GROUP VI.

## LEATHER AND INDIA-RUBBER INDUSTRY.

1. Upton, Franklin & Co., . Boston, . . Sole Leather.
2. Schayer Brothers, . . Boston, . . Alligator Hides.

## GROUP VII.

## METAL INDUSTRY.

1. American Tack Co., . . Boston, . . Tacks and Brads.
2. Barny, E. H., . . Springfield, . Skates.
3. Douglas Axe Manuf. Co., . Boston, . Axes.
4. Dunbar, Hobart & Whidden, So. Abington, . Tacks and Nails.
5. Field, A., & Sons, . . Taunton, . Tacks and Nails.
6. Henshaw, Edward, . . Boston, . Shoe Findings.
7. Moulton, E. S., . . Chelsea, . Pipe Tongs.
8. Nichols, F. W., . . Boston, . Hinge.
9. Tower, Geo. W., . . Cambridgeport, Pipe Tools and Dies.
10. Sherman, W. B., . . Boston, . Spades and Shovels.

## GROUP VIII.

## WOOD INDUSTRY.

1. Sturtevant, B. F., . . Boston, . Wood for Shoe-pegs.
2. Parks, A. S., . . Winchendon, . Water-pails.

## GROUP IX.

## STONE, EARTHENWARE AND GLASS INDUSTRY.

No Exhibits.

## GROUP X.

## SMALL WARE AND FANCY GOODS.

No Exhibits.

## GROUP XI.

## PAPER INDUSTRY AND STATIONERY.

No Exhibits.

## GROUP XII.

## GRAPHIC ARTS AND INDUSTRIAL DRAWING.

1. Prang, L., & Co., . . Boston, . Chromo-Lithographs.

## GROUP XIII.

## GENERAL AND AGRICULTURAL MACHINERY.

1. Ashcroft, E. H., . . . Boston, . . . Steam-fittings.  
Afterwards exhibited in British Department.
2. Avery, J. G., . . . Spencer, . . . Wool-spinner.
3. Bigelow, H. H., . . . Worcester, . . . Heel Machinery.
4. Dodge, Theo. A., . . . Cambridge, . . . McKay Shoe Mach'y.  
Not examined by the Jury.
5. Eames, Bigelow & Co., . . . Framingham, . . . Wheels.
6. Evans, A. D., . . . Boston, . . . Covered Shuttles.\*
7. Excelsior Gas Machine Co., . . . Warren, . . . Gas Machines.
8. Hall, Thomas, . . . Northampton, . . . Vise.
9. Knapp Dovetailing Mach. Co., Northampton, . . . Dovetailing Machine.
10. Lamb Knitting Machine Co., . . . Chicopee Falls, . . . Knitting Machines.
11. Morse Twist Drill Co., . . . New Bedford, . . . Twist Drills.
12. Raddin, J. G., . . . Lynn, . . . Carriage Wheels.
13. Stephens, . . . . . Vise.†
14. Townsend, H. E., . . . Boston, . . . Shoe Machinery.
15. Whitney, Baxter D., . . . Winchendon, . . . Wood-work'g Mach'y.
16. Witherby, Rugg & Richardson, Worcester, . . . Wood-work'g Mach'y.
17. Ferguson, —, . . . Roxbury, . . . Sheep-sheari'g Mach.†

## GROUP XIV.

## PHILOSOPHICAL SURGICAL INSTRUMENTS.

1. Lowe, N. M., . . . Boston, . . . Hygrodeik.
2. Spare, John, . . . New Bedford, { Hyperbolic Paraboloid  
and Hyperboloid.

## GROUP XV.

## MUSICAL INSTRUMENTS.

1. Mason & Hamlin Organ Co., . Boston, . . . Organs.

## GROUP XVI.

## THE ART OF WAR.

1. Smith & Wesson, . . . Springfield, . . . Revolvers.
2. U. S. Armory, . . . Springfield, . . . Arms, &c.
3. U. S. Cartridge Co., . . . Lowell, . . . Metallic Cartridges.

## GROUP XVII.

## THE NAVY.

No Exhibits.

\* In official catalogue, but not exhibited.

† Not in catalogue, but exhibited.



## GROUP XVIII.

## CIVIL ENGINEERING, PUBLIC WORKS AND ARCHITECTURE.

- |  |  |
|--|--|
| 1. Voelckers, Theodore, . . . Boston, . . .          | { Models of plates and<br>anchors for floor-<br>timbers. |
| 2. Brackett, E. A., . . . Winchester, . . . Fishway. |  |

## GROUP XIX.

THE PRIVATE DWELLING-HOUSE, ITS INNER ARRANGEMENT AND  
DECORATION.

No Exhibits.

## GROUP XX.

## THE FARM-HOUSE, ITS ARRANGEMENTS, FURNITURE AND UTENSILS.

1. Appleton, F. H., . . . West Roxbury, . . . Plan of model farm.

## GROUP XXI.

## NATIONAL DOMESTIC INDUSTRY.

No Exhibits.

## GROUP XXII.

EXHIBITION SHOWING THE ORGANIZATION AND INFLUENCE OF MUSEUMS  
OF FINE ART AS APPLIED TO INDUSTRY.

No Exhibits.

## GROUP XXIII.

## ART APPLIED TO RELIGION.

No Exhibits.

## GROUP XXIV.

OBJECTS OF FINE ARTS OF THE PAST, EXHIBITED BY AMATEURS AND  
OWNERS OF COLLECTIONS.

No Exhibits.

## GROUP XXV.

FINE ARTS OF THE PRESENT TIME, WORKS PRODUCED SINCE THE SECOND  
LONDON EXHIBITION OF 1862.

1. Way, C. Granville, . . . Boston, . . . Landscape Painting.

## LIST OF AWARDS.

### MASSACHUSETTS EXHIBITION.

#### GRAND DIPLOMAS OF HONOR.

1. The State of Massachusetts, for valuable Reports and Documents, and for the enterprise shown by its organized personal representation at Vienna.
2. The City of Boston, for its full and complete illustration of its School System and Schools.

#### MEDALS FOR PROGRESS.

1. Avery, John G., . . . Spencer, . . . Continuous Wool-sp.
2. Bigelow, Horace H., . . . Worcester, . . . Heel Machinery.
3. Blackinton, S., & Sons, . . . N. Adams, . . . Fancy Cassimeres.  
(Exhibited by Pomeroy & Plummer, N. Y.)
4. Excelsior Gas Machine Co., . . . Warren, . . . Appar. for mak. gas.
5. Hall, Thomas, . . . Northampton, . . . Parallel Bench Vise.
6. Howe, Dr. G. S., . . . Boston, . . . Pub. for the Blind.
7. Knapp Dovetail'g Machine Co., Northampton, . . . Dovetailing Mach.
8. Lilly, Young, Pratt & Brackett, Lynn, . . . Boots and Shoes.
9. Mason & Hamlin Organ Co., . . . Boston, . . . Cabinet Organs.
10. Morse Twill Drill Co., . . . New Bedford, . . . Incre'se Twist Drills.
11. Prang, L., & Co., . . . Boston, . . . Chromo-Lithogr'phs.
12. Smith & Wesson, . . . Springfield, . . . Revolvers.
13. Sturtevant, B. J., . . . Boston, . . . Wood for Shoe-pegs.
14. Whitney, Baxter D., . . . Winchendon, . . . Wood-w'k'g Mach'y.

#### MEDALS FOR MERIT.

1. United States Armory, . . . Springfield, . . . Arms & Ammunit'n.
2. Baker, Walter, & Co., . . . Boston, . . . { Chocolate and Cocoa  
preparations.
3. Blackinton & Co., . . . North Adams, . . . Cassimeres.  
(Exhibited by Pomeroy and Plummer, N. Y.)
4. Barny, E. H., . . . Springfield, . . . Club Skates.
5. Brewer, Gardner, & Co., . . . Boston, . . . Fine "G. B." Shirt'gs.
6. Brewer & Tileston, . . . Boston, . . . School Publications.
7. Hauthaway, C. L., & Sons, . . . Boston, . . . Leather Dressings.
8. Lamb Knitting Machine Co., . . . Chicopee Falls, Hand-knitting Mach.
9. Marcon, Jules, . . . Boston, . . . { Geognostic Map of  
the World.
10. Mason, Luther Whiting, . . . Boston, . . . { Syst'm of Instruction  
in Music.
11. Parks, A. S., . . . Winchendon, . . . Amer'n Water-pails
12. Ross, Joseph L., . . . Boston, . . . School Furniture.

13. Bigelow Carpet Co., . . . Clinton, . . . Carpets.  
(Exhibited by W. & J. Sloane, New York.)
14. Stephens, —, . . . . . Vises.
15. Townsend, H. E., . . . Boston, . . . Shoe Machinery.
16. Underwood, Wm., & Co., . . Boston, . . { Canned Fruits, Fish,  
V'getab's & Meats.
17. United States Cartridge Co., . Lowell, . . . Metallic Cartridges.
18. United States Armory, . . . Springfield, . . . Gunstocks.
19. Walker, Q. H. & G. M., . . . Worcester, . . . Boots.
20. Witherby, Rugg & Richardson, Worcester, . . . Wood-w'king Mach.

#### MEDALS FOR CO-OPERATORS.

1. Felt, Luther W., with J. G. Avery, Spencer.

#### DIPLOMAS OF MERIT OR HONORABLE MENTION.

1. American Tack Co., . . . Boston, . . { Samples of Tacks &  
Brads. [Nails.
2. Dunbar, Hobart & Whidden, . So. Abington, . . Samples of Tacks &
3. Ferguson, —, . . . . . Roxbury, . . . Sheep-shear'g Mach.
4. Henshaw, Edward, . . . Boston, . . { Shoe Tools and Sam-  
ples of Pegs.
5. Lowell Institute, . . . Boston, . . { Disseminat'n & Pro-  
motion of Science.
6. Newton, the town of, School Reports and Photographs of Buildings.
7. Nichols, F. W., . . . Boston, . . . Wall Desk.
8. Nye, W. F., . . . . . New Bedford, { Sewing-machine and  
Watch Oil.
9. Shattuck, W. G., . . . Boston, . . . Sch'l Desks & Seats.
10. Worcester, city of, School Reports and Photographs of Buildings.
11. N. B. Sherman, . . . Boston, . . . Shovels and Spades.

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Diplomas of Honor, . . . . .	2
Medals of Progress, . . . . .	14
Medals of Merit, . . . . .	20
Diplomas of Merit, . . . . .	11
Medal for Coöperators, . . . . .	1

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Total Awards, . . . . . 48

REPORT OF MR. HILL.

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The undersigned, appointed an Associate Commissioner on the part of the State of Massachusetts to the Exposition held at Vienna, is directed, by the terms of his commission, to report to the next legislature. In conformity with this duty, he begs to submit the following:—

Under the arrangement made between the writer and his associates, the general organization and conduct of the Commission in Vienna was undertaken by the Chief Commissioner, and the undersigned was charged with the special duty of examining the details of the Exposition. This report will therefore be principally devoted to a description of this Exposition, a consideration of its relation to the productive industries of the world, and the proper lessons that we should draw from it as citizens of Massachusetts.

The writer, having received his commission on the 31st day of March last, took passage from Boston by steamer of the 12th of April, and arrived in Vienna on the 11th of May, having made only a few days' delay in England, to examine some of the large manufacturing establishments of that country. The troubles in the United States Commission had but a few days before come to a head, and everything connected with our portion of the Exposition was in a state of disorganization and confusion.

Mr. Jackson S. Schultz, appointed by our government to succeed our former Chief Commissioner, arrived, however, upon the 15th of May. The writer considered it his first duty to offer his services to Mr. Schultz, in case he could thus serve the interests of any Massachusetts citizens, or advance the badly delayed exhibition of the United States. Mr. Schultz, however, undertook his work with the help of a small num-

ber of the assistant United States Commissioners, whom he selected at Vienna, and, with his well-known vigor, advanced it much more rapidly than could have been expected.

In this connection, the writer's knowledge of the facts makes it proper for him to speak of the services of Professor E. N. Horsford, of Cambridge, in this State, who, as a member of the scientific commission of the United States, was present in Vienna, and who gave himself unsparingly to the assistance of the Chief Commissioner. Much of the progress which was made, both in the preparation of the exhibits and in the organization of committees, juries, etc., was due to his efforts. Massachusetts exhibitors especially are indebted to him for attention to their interests.

Before the arrival of the writer, Mr. Frank Millett, the secretary of the Massachusetts Commission, who had been despatched by Mr. Adams to Vienna, had secured proper rooms for the use of the Commission. These rooms were at once taken possession of, and the Commission was organized and immediately entered upon the duties assigned to the different members.

As has been said, it was a principal duty of the undersigned to study the details of the Exposition, and, therefore, with the exception of such attendance as was necessary at the office of the Commission, and a week devoted to the Patent Congress, of which mention will be made hereafter, his whole time at Vienna was spent on the grounds.

Upon entering upon the study of the Exposition, the first points which engaged attention were those relating to the general plan of the buildings and their inclosure. This matter seems to have received a great deal of thought on the part of the Austrian authorities, but it is doubtful if they settled it in a way perfectly satisfactory to a majority of visitors; and, in fact, it is not easy of solution in an Exposition so large as this. The French Exposition of 1867 was built in the form of an ellipse, in which the different nations occupied segments, whose separating lines radiated from a common centre, while the different classes or groups of exhibits in the different nations were placed in the same ring or circle. Thus, in passing from the centre outward, the visitor was always among the products of the same nation, but went

from one class to another. In moving around the centre on any given circle, he was always in the same group or class, but went from one nation to another. Admirable as this plan was in theory, grave objections were found in practice. First, it was found impossible to adjust properly either the space devoted to each nation, or the relative space occupied by different groups in each nation. Moreover, the building, arranged in this form, could only be lighted from above, and by experience it has been found very difficult to make roofs so lighted water-proof, when only erected for temporary purposes. Lastly, to the majority of visitors, the arrangement described is extremely confusing, on account of the impossibility of keeping the points of the compass, and of finding desired places of exit, after circulating through the curves of the exhibition building. All these defects would have been greatly exaggerated, had the plan of the Paris Exposition been repeated at Vienna, owing to the vastly greater size of the latter exhibition, which was nearly four times that of the former.

The Austrian authorities decided to abandon the idea of the association of like groups in the different nations, except in certain special cases,—as fine arts, machinery, etc., which were placed in buildings by themselves,—and adopted the plan of comparatively narrow buildings, lighted from the side, in which the only aim was to place the products of each nation by themselves. The main building, or industrial palace, consisted of a hall three thousand feet long and eighty-three feet wide; and, to give additional space, this was crossed by seventeen transepts, averaging five hundred feet long by fifty-one feet wide. Parallel with this main building, there was erected a machinery hall, twenty-six hundred and fifty-one feet long, and one hundred and sixty-four feet wide. Beyond these were erected another series of buildings for pictures, statuary and other works of art. This arrangement of comparatively narrow buildings, while it gave an opportunity of lighting from the sides by windows under the roof, added very largely to the cost, on account of the great extent of wall in proportion to the space inclosed. It also rendered the work of one who wished to trace any particular branch of production through different nations very difficult, by

reason of the distances which separated them. This difficulty was again aggravated by the fact that the original buildings proving much too small, between nearly all the transepts covered courts were built, and, in addition to this, other large buildings were erected by several governments, in which a portion of their groups or classes of exhibits were displayed. It thus became a serious work, even for those most familiar with the Exposition, and to all others a hopeless task, to trace a single class of productions through the spaces of the different nationalities.

Another great objection to the arrangement of buildings adopted was the utter absence of that impressiveness, which arises from general effects. Had the buildings been so designed as to inclose the great mass of exhibits under one roof, and bring them all in sight at one time, the Exhibition would have been wonderfully more grand and interesting than it was. As arranged, it was only to those who spent a long period in daily examination of the various transepts, courts, rooms, buildings, "annexes," special exhibits, etc., that its vastness became apparent. The majority of visitors, who came for a few days and went away again, never saw one-half of the various places of exhibition, and got so confused an idea of what they did visit that it was impossible for them to associate the special rooms, halls, etc., with the nations which occupied them, or to understand the relations of their contents to those of other neighboring apartments.

If it could be decided, before the erection of the main edifice, what space in the whole, and what in each group or class of objects each nation would require, the construction of proper buildings would be much simplified. But this has been found impossible, and in all the later exhibitions the demand by most of the leading nationalities has, at the last moment, been found greater than the space allotted, and they have been forced to place a considerable portion of their articles of exhibition in specially erected buildings, entirely separated from their proper association with objects of the same kind, and from others from the same country. Thus, at Vienna, the American exhibit of agricultural implements—the finest, in some respects, in the exhibition-ground—was placed in a building, erected for the purpose, behind the general agricult-



ural buildings of the western European nations. In an obscure place, of special interest to only a fraction of the visitors, it was entirely unseen by the great mass, to whom it would have been a revelation of our mechanical skill and taste, had their attention been drawn to it by finding its exhibits before them while examining the other departments in one common building. The same thing is true of the German school system, of considerable portions of the Swiss exhibition, of the French, of part of the Russian, etc.

The most important points in designing a building for the purpose of an exhibition would seem to be,—

*First*, the study of some water-tight arrangement for lighting from above, by what are called monitor roofs, or otherwise, which would enable the architect to cover in as large a space, both in length and breadth, as he should see fit, in one open area, uninterrupted with corners or angles to break the view.

*Second*, an arrangement of exhibits by which the different nations should have all their goods together, so that what each had contributed to the Exposition could be at once seen, and an idea easily gained of the character and quality of its productions in each group.

*Third*, the arrangement should be such that the exhibits in the different groups, if not directly contiguous to those of the same groups belonging to the next nation, should at least be disposed in the space of each nation according to some simple and easily understood rule, so that the position of any particular class could be found among their exhibits.

Finally, it would be a great advantage if, while the roof and its supports were erected in good season, the buildings were so constructed that the size could be readily extended in certain directions, so as to be prepared for an unexpected amount of goods from any nation without forcing that nation to break up the proper order and classification of its exhibits by putting a part of them in separate buildings.

In drawing attention to these points, it is to be remembered that, while an exhibition like this is of much interest and value to specialists, men of science, manufacturers and merchants, its great usefulness lies in its character of an instructor of the masses.

The great majority of visitors are only temporary, and therefore to render an exposition of its greatest value to such people it must be so arranged as to enable them to make comparisons easily and clearly.

Undoubtedly, the Vienna Exposition was, above all things, intended as a means of education to the Austrians; but, it is safe to say, that of all the Austrians who visited it, not one in a hundred went away with any clear idea of its vastness as a whole, or of the relative richness of the different countries, in the twenty-six or more classes into which it was divided.

In regard to the buildings themselves and the material of which they were composed, owing to the nature of the soil in the Prater where the exhibition was held, the principal erections were all placed on piles. The walls were of brick, apparently very heavy and covered with cement. The roof was a semi-circular arch. The main entrances were built with much regard to architectural effect, and adorned above with emblematic figures. The most striking portion of the buildings was the huge dome which stood in the centre of the length of the great industrial palace. This was designed by Mr. Scott Russell, and was a really extraordinary undertaking. It stood on a circle of large piers. From the summit of these, angle-iron beams ran up towards the centre, where they all rested against an iron ring which received their thrust. The ceiling of the dome was attached to the underside of these beams. Its base was eighty feet above the ground and three hundred and forty-eight feet across; above, it opened through the ring into a cylindrical lantern, one hundred feet in diameter and thirty feet high, and from that into a smaller lantern. The whole height was not less than two hundred and seventy-five feet.

The portion of the park devoted to the Exposition included about three hundred and fifty acres. On these were, first, the industrial palace, of which we have spoken, running east and west, having its seventeen transepts across it, and its great dome in the midst. Parallel to this on the north, and distant from it about five hundred feet, was the machinery-hall. Between these two, near either end, were large wooden buildings, each covering somewhat more space than the great Coli-

seum, so called, lately erected in Boston, which were devoted to agricultural exhibits. In a line with these, and between the industrial and machinery-halls, were numerous other buildings, —some erected by the various countries to display their surplus exhibits, some the special buildings of private exhibitors.

Beyond the end of the industrial palace were the art buildings, also of brick and stucco, handsomely decorated with architectural ornaments, and surrounded with arcades. In the fifty-two rooms of these buildings were displayed some thirty-two hundred paintings and one thousand statues.

Still beyond these, an arched gateway led to a portion of the grounds in which were many buildings of a temporary nature, some illustrating the various types of peasant houses of Eastern Europe, others built as models of stables, barns, etc., etc. South of the great industrial palace, before its front, were many other erections, such as the Persian and the Egyptian palaces; the Japanese village, of which the very wood was brought from Japan; iron buildings; others of artificial stone; others set up by the lighthouse board, the navy department, and other branches of the Austrian administration. With these were characteristic buildings of almost every nationality, erected as restaurants. Here also was the palace of the Emperor of Austria, and, opposite to it, the juries' pavilion. Altogether, there were more than two hundred buildings within the inclosure of the Exposition grounds. These grounds themselves were laid out in squares of the finest turf, intersected with gravel walks, bordered with beds of flowers, and dotted with ponds, in which were fountains. The whole was arranged with that taste which seems natural to the Austrians.

This description gives but a feeble idea of the grounds and buildings of the Vienna Exposition, upon which the Austrian government expended more than ten millions of dollars, and which was intended to be by far the most complete of any that has been held.

Turning from the buildings to the articles in them, the first thing to be noted is this: that, contrary to the general impression in America, the contributions of the different nations were not mere irregular collections of incidental objects, furnished by parties who desired to advertise themselves, but,

on the other hand, were well assorted, and generally complete illustrations of the industries of the several countries, with one unfortunate exception. We believe this is true of all the principal nations. The spirit which seems to have animated them is well illustrated in the address of the French commissioners to the public at the time of their appointment. After speaking of the material advantages to be gained from this Exposition, they continue :—

“Beyond these material advantages, on which it is useless to dilate, so obvious are they, there is always in France a sentiment to which appeal has never been made in vain—that of patriotism. France must be worthily represented at the universal Exposition in Vienna. She must present herself there in a manner to prove that she has not fallen from the high rank which belongs to her in the civilized world, and that on the morrow even of the dolorous events which have lately transpired, she is ready to sustain the reputation she has acquired in the arts—in productions where intelligence and modern science, taste, invention or skilled hand-labor have gained a superiority never contested.”

In this spirit, the French entered into the Exposition, and government and people joined in making it in fact all that this address indicated.

It is but fair to add, that the spirit of the other leading nations was not behind that of the French, and that they made a good and general display of their various industries, regardless of the consideration that they might not gain for them an immediate sale. From this it resulted the Exposition was in reality a universal exposition of the world's industries, and that the visitor could there study the present status of any matter in which he was interested,—in every part of the Old World, at least.

The arrangements of the exhibits of the different nations in the Exposition was simply geographical. Those of the New World being at the extreme western end of the various buildings, the Japanese and Chinese at the eastern, the other countries between, according to their geographical positions. The machinery was, as has been said, in a building by itself, but the exhibits of the different countries were there arranged in the same order. The agricultural machinery and produc-

tions were divided between the two buildings appropriated to them, that between the westerly ends of the main and machinery halls to the western European nations, the other to the more easterly. Many countries—as Brazil, the United States, China, Japan, etc.,—displayed what they had of agricultural productions in the great industrial palace, with their other exhibits. The purely art-exhibitions, including paintings, statuary, engravings, etc., were also gathered into their own group of buildings, in whose fifty-two rooms those of each nation were, as far as possible, arranged by themselves.

The relative space occupied by the different countries will be found in the Appendix. The number of contributors from each country, as represented in the second edition of the official catalogue, will also be found therewith, and will be some indication of the relative display of the different countries. It is to be remembered that the space occupied is not always an indication of the amount of exhibits, as in some countries they were vastly more crowded than in others; and in some, as the United States, any number of duplicates were admitted, while in others, exhibitors were confined to such as would properly illustrate their manufactures. The number of exhibitors, again, has little to do with the number or quantity of the articles exhibited, very much larger and more varied collections being sent by some individuals than by others. Again, in some countries, as the United States, the exhibitors were all individuals, while from others it was often the custom for a large number of persons to make what is called a "collective exhibition." Thus, some of the French silk manufacturers united in exhibition of their products, covering nearly half as much space as all the United States. Also, many cities, many governmental departments, many colleges, museums, schools of agriculture, etc., sent magnificent collections. Many even fitted up large buildings at their own expense, which yet count only for a single exhibitor. Special attention should be given to this mode of exhibition, which secures many advantages at the minimum of expense. The system is calculated to induce a better and more complete collection of the class of productions in question. It enables the parties concerned to avail themselves of the best talent in the arrangement. The importance and size

of the collective exhibition gives opportunity for display, and draws the attention of the public to it in a way that the individual exhibitors could not separately. Should our citizens take, as it is to be hoped they will, a prominent part in the United States Centennial Exposition, this plan is worth consideration by our various classes of manufacturers.

Upon the organization of the Commission, one of the first points which demanded the attention of its members was the manner in which they could best fulfil their duty in respect to the examination of the Exhibition, and their report upon the same. A very slight acquaintance with the Exposition made it sufficiently evident that it would be wholly useless to attempt, personally, a detailed examination of the different groups of the Austrian classification. How utterly impossible the enormous size of the Exposition rendered this undertaking, is shown by the work of the juries. Most of the important groups were subdivided among various sub-juries, so that in fact there were eighty-one actual parties who entered upon the jury-work. These juries threw themselves into their labors with the utmost energy, yet many of them were more than two months in the examination of their special groups. Another consideration with the Commission was this: that a valuable examination could only be made in the different groups by persons who were specialists, as it were, and who entered upon the work with a previous knowledge of the art. For these reasons they determined, as has been stated in the report of the Chief of this Commission, to employ so far as they could find them at hand, and as far as the appropriations of the State would permit, persons in the work who would answer to the description of specialists in the various departments. In addition to the reports thus engaged, the undersigned will only call attention to some general considerations which the study of the Exposition suggested, and which seem to him worthy of notice. And first, of the comparative condition of the arts in the United States and in other countries. On this point, it may be said that in all practical matters,—in machinery, in agricultural tools, perhaps in the preparation of articles of food,—in the groups from V. to XVIII., so far as matter is concerned, and not the style or

taste, including textiles, leather and rubber, metal and wood industry,—in manufacture of paper, sugar, and the thousand other useful matters; in our philosophical and surgical, and in musical instruments,—we appeared, or should have shown ourselves, if we had been adequately represented in this Exposition, quite on a par with any other people. In machinery of every kind, it was universally conceded that our collection, small as it was, and lacking in every direction those labor-saving inventions so familiar to us at home, but unknown abroad, was still the most original and admirable display in the machinery-hall. Among other modes of improving the opportunities of the Exposition of Paris in 1867, the British government sent, as they did also to Vienna, a commission of practical artisans, whose reports, afterwards printed, were among the most interesting and valuable of the former exhibition. As a result of their examination of American machinery, one of them made the following statement:—

“In our country we seldom go back to first principles in invention. We cling to some parts of the old arrangements. If a motion has been circular, we try to make a better circular motion; if horizontal, we try to get better results by a superior horizontal arrangement, but seldom think of throwing to one side all that has been done. The American, on the other hand, seems to look at two things—the means at his command and the end to be attained; he seldom troubles his head with the laws or the opinions of others.”

Another of the same artisan commission writes, speaking of the Americans:—

“The rough-and-ready way in which they cast aside old theories, the boldness with which they start out on a new and untrodden path, the entire confidence they have in themselves, and their sagacity in finding out what is to be done and doing it—all find expression in their work. \* \* \* Many a good thing rough-hewn by them is destined to live, and influence the future of the world.”

These statements are quoted because they are very admirable illustrations of the character of our inventive talent, and because they express very forcibly what was constantly said both by



English and by Germans and Austrians, respecting our mechanical exhibitions at Vienna. In respect to our display of agricultural implements, it was very strong in mowers and reapers, and very weak in other directions. But in both these important machines Americans had every reason to be satisfied. The contrast between them and those of other countries was very marked. The lightness and strength, the convenience in operating, the superior workmanship, were all acknowledged, and have resulted, as we are informed, in giving to the American manufacturers nearly all the business of supplying the agricultural regions of Eastern Europe.

The qualities which give these implements their superiority have given the American-made sewing-machines the same, and they are sold in Europe at much higher prices than the same styles of European manufacture. It is said that even where American companies have carried to Europe American machinery and an American foreman to oversee the work, that they are unable to produce the same quality of machines as are made in America. This can only be due to the superior character of our workmen, a superiority arising from their higher intelligence, and this again from their better education. In the opinion of the writer, the superior character of these machines to those of European manufacture is borne out by that of many other classes, which were not displayed in the Exposition. In many departments it is not unreasonable to believe we should have a good foreign market were our machines better known.

In the great departments of Group I., mining, quarrying and metallurgy, and Group II., agriculture and forestry, it was made evident to us that the leading nations of Europe have given far more attention to the matter of scientific education than we have done, and the exhibition of the various schools of mines, of agriculture, etc., were among the most striking and interesting portions of the Exposition. The pursuit of agriculture is to us in Massachusetts of course of more general practical interest than that of mining, and more attention was given to the subject, and as a result of our observations our confidence in the advantages of a scientific education as a foundation for its successful pursuit was greatly strengthened. A special report on this subject has been prepared, and is particularly

recommended to the attention of our citizens. In the department of forestry, most striking exhibitions were made,—the leading schools, forestry associations and departments, in a number of instances erecting large houses in the rough style of the forest buildings to illustrate this work. These were filled with specimens of the native woods, worked and unworked, of the various articles produced from the wood in the forests or in their neighborhood, samples of machinery and tools used, and especially with maps, plans, models of dams, slides, rope-tramways, and all the means of illustrating their modes of carrying on their work. With these were numerous books on the subject and many volumes of written reports, showing the details of the management. From the great attention given by the Austrians and other older nations to this branch of industry, we should do well to draw a lesson. It is believed that if the State would constitute either a special commission, or a branch of the board of agriculture, that should give particular attention to the subject of forestry, should examine the foreign modes of encouraging arboriculture and making it pecuniarily productive, and should aim at giving popular information and awakening popular interest on the subject, it would be vastly to the interest and advantage of the Commonwealth.

But if in those industries which tend to the physical comfort and convenience of mankind the United States stood as high as, and in many respects higher than, other countries, in the Exposition, it was far otherwise in the sphere of art, both in its purer conditions of painting and sculpture and in its application to manufactures. In the preparation for the Exposition in this country, those gentlemen who originally had the charge of our interests did not, with one or two exceptions, apparently command the confidence of our artists nor of our manufacturers who depend on their art or taste to give value to their works, sufficiently to persuade them to send their productions to Vienna. Moreover, a single walk through the art-galleries and down the great nave of the industrial palace, in which the exhibits of the applied arts were generally assembled, would have satisfied the most doubting that if we had done the best we could we should have still made a most deplorable failure in this side of the Exposition.

In the arrangement of the exhibits, this department was made the most prominent of the whole. Passing by the art-galleries, and speaking only of the arts in their applications to industry, the whole of the great central nave of the main building was substantially devoted to this form of art. With the English, the most magnificent displays were made of porcelain, pottery and glass; and the cases of the Mintons, Copeland, the Worcester works and Wedgwood were splendid illustrations of the value that this nation sets upon this work. Nor were the French behind them. The porcelain of E. Colinot, Deck and Jules Harvey, of Cristofle, Barbadienne and others; sustained their ancient reputation. It is said that the English in earlier Expositions were much astonished and mortified at the inferior position in which they appeared in comparison with the French, and set themselves to work in earnest to introduce a better and higher art into this class of work. We do not think we are wrong in saying that to-day they show in this department a more varied collection of beautiful forms, a more original taste, and a better application of the models of antiquity, and of the ideas of such nations as the Indian and the Japanese and others, than do the French.

In artistic metal-work there were some admirable displays,—as those of Elkington and Hancock, in the English department, of Barbadienne and Cristofle among the French. Of the work of the latter too much cannot be said. Much of the painting and sculpture of the French, though powerful and artistic, is morbid in its character, rioting in the horrible or the sensual; but in this metal-work of Cristofle's, the art was of the purest and simplest character, taking its subjects from the most common objects of nature, and working them into the ornamentation of the material with a simple grace as healthy in tone as it was artistic in character. Both English and French work in this department, and measurably also in that of pottery and porcelain, showed very distinctly the influence of Japanese art, the merits of which they incline to adopt without taking its absurdities.

In furniture, the English had some very artistic work. Their manufacturers employ some of the best artists to pre-

pare designs for them. The simplicity and beauty of these are very far removed from the heavy styles, overloaded with machine-made ornaments, which we too generally find with us. In furniture, the Austrians were however perhaps of all exhibitors the strongest. Their forms were for the most part very simple, and their great effort seemed to be to bring out as strongly as possible the natural beauties of the wood. Where ornament was introduced, it was in the form of inlaying, or of hand-carving. The artistic feeling of Europe seems to have recognized the fact, that those objects alone are really beautiful which have been produced by hand-labor, and by the individual thought and taste of the artist applied to each individual ornament.

A very attractive department in the Austrian section, and one to which they devoted much attention, was that of interior decoration. Many small rooms were fitted up by different artists, and, without exception, the combinations of colors and effects were those of refined and cultivated tastes.

One of the most interesting collections, in which artistic feeling had scope to display itself, was that of the carpets, of which there were literally hundreds in the Exposition. Undoubtedly the East, with her hand-made work, carried the day here, and of the Eastern nations the Persians were perhaps the most perfect. Equal to any in richness of effect, they surpassed in the perfect harmony of color. It is needless to say that the good feeling of all these Eastern nations leads them to avoid those glaring contrasts of color and staring patterns which are too common in our windows; and it was noticeable also that all their figures had a perfectly flat effect. The apparent projection of flowers, fruit and geometrical figures, looking as if in danger of tripping the foot at each step, is most carefully avoided. The English, and in a measure the French, showed the effects of a study of these Eastern productions, and the best work of the English certainly was in styles borrowed from them.

The Austrians were still closer students of these Eastern nations, and much of their display could hardly be distinguished from its original.

Of cast-metal artistic work there was an immense quantity

in the Exposition, not only in bronze, but in iron. Special attention is called to this latter material, because its management has become so well understood in its application to this purpose, that it produces as clear and fine-surfaced castings as bronze, and in this way good works of art can be cheaply supplied.

The rooms of the fine-art buildings, many as they were, were always filled with crowds of people. The number of visitors here was the best evidence of the general interest taken in Europe in the arts. The report which we have caused to be prepared, to present with this, will say all that is necessary on this point.

These few lines have been devoted to a description of the art-manufactures exhibited at Vienna, not for the purpose of attempting to give any idea of their artistic merit, nor of their extent, but only to show how great a degree of attention is now given abroad to this form of industry.

Both governments and people there are exerting themselves to extend and improve the popular taste for art, and to elevate the artistic character of their national productions. To this end they are encouraging their museums and schools of art, and the general introduction of drawing in their public schools. The influence of the Kensington Museum upon the taste and the artistic character of the English manufacturers cannot be overstated, and the wonderful advance they have made between the Paris Exposition and that of the present year, is largely due to its teachings. Among other modes of instruction, it makes appropriate collections of works of art, and sends them out into the different manufacturing districts, there to remain for several months, open to the free inspection of all who wish to study them. On the Continent, also, those interested speak in the highest terms of the influence of their museums and art-schools in improving the general taste. One of the most noticeable things about the art-manufactures in the Exposition, was the number of beautiful and characteristic objects which were bought for these different European museums.

This is not the place to discuss the propriety of encouraging art in comparison with merely mechanical labor; nor to

consider how far, as a nation becomes richer, it is necessary to elevate the tastes, and to furnish new and high interests to the people, if we would prevent them from degenerating into luxury and dissipation. Our State has taken its position in this matter, by introducing drawing into the public schools, and by the encouragement of artistic study in the schools of technology; and it only remains to push on the work as vigorously as possible. The encouragement of museums is certainly one of the most direct and effective means of so doing, and, great as is their influence in Europe, they would be much more powerful here. Indeed, something of the kind is essential to our art-education. Students and the public in Europe have the great advantage over us of living in countries where they are continually in presence of art-work. With us, who have not this inspiration, there remains only the influence of museums, as a means of cultivating an artistic taste in the community. The writer believes that with us the natural taste is better than in most European countries, and that, with proper effort, our people can be educated to take high rank as artistic producers; and it is not impossible that when we do acquire an artistic skill, our work will be found to be more original and more beautiful than that of many people now far in advance of us in this department.

Some consideration was given by the writer at Vienna to the question of the value of Expositions—which may be considered as a species of temporary museum—as a means of developing industry, both of a practical and an artistic character. In the United States, particularly, there has been a tendency to think lightly of them. It is believed that this is a mistaken view. In respect to the international exhibitions, held in foreign countries lately, it has been felt that, as an immediate means of advertising our productions, they were of no use to us, on account of the higher range of prices prevailing in the United States. In this there is less difference than is commonly supposed; and there is an advantage in many classes of our productions—in point of convenience, adaptability, or amount of work they will perform, or that they will endure—which would more than outweigh this difference, were their quality and character better understood abroad.

Again, there is in some quarters an idea that we are so superior to other nations that we have nothing to learn from them. It is perhaps true, in regard to certain industries, that we could teach more than we could learn; but in entertaining this opinion, there is great chance that others, who are taking every advantage for educating themselves, may be passing us in the contest. In other industries—pertaining to matters of art especially—our citizens, admitting our inferiority, have undervalued the artistic side of expositions, and the value of art generally. Leaving the moral and social considerations out of view, we believe there cannot be a greater mistake, in view of material prosperity. The State, like the individual, which can add to its practical skill good taste and artistic ornament, has added another element to its means of progress in wealth and influence.

So far, then, from joining in the general feeling in regard to foreign expositions, the writer believes that they can be made of very great value to us. Had our manufacturers more generally sent their productions to Vienna, it cannot be doubted that they would have been repaid, both pecuniarily and as a matter of education. While there is too much disposition with us to rest in the belief that we cannot reach foreign markets, the English, French, and above all, the Germans, are using every effort to learn the tastes and wants of other nations, and to adapt themselves to them, and are seeking every means to show what they can furnish.

We, in Massachusetts, cannot now afford to let pass any opportunity for educating our producers, nor for opening new markets.

The last census reports show that we are hardly holding our own with the rest of the United States in the increase of our manufacturing interests, and that some of them are in fact advancing much more rapidly than we.

In former times, the rocky nature of our soil and our climatic conditions forced us into manufacturing industries, in which we acquired a skill and reputation which made it difficult for other parts of the country to compete with us; but with the increase of wealth in other sections, the requisite skill is there being gained for competition with us, and we



can only hold our own by a careful encouragement of every means of keeping us up with the latest improvements, of introducing among us new departments of manufacture, especially in the direction of matters of taste and art, and finally of opening to us every possible avenue for the disposal of our manufactures, and teaching us how to adapt our wares to these new markets. We think the State has shown its disposition to do this in the encouragement of scientific schools, whence well-trained and liberally educated men will carry a new influence into our manufacturies, and in the introduction of drawing into our schools in a manner which will develop in the next generation new and artistic forms of productions. But we believe that these means may be more powerfully supplemented would the Commonwealth lend its influence to the encouragement of properly conducted expositions among ourselves in other departments, as it does in agriculture. By a full comparison of our productions through the intercourse which would thus be produced among our manufacturers, by a well-directed effort to bring in the work of others in other parts of the United States and from abroad, and finally by getting together and setting open to the body of the people all these works of art, both pure and applied to industry, which are either not known or not appreciated by our citizens at large, we believe a stimulus could be given to industry more immediate and more powerful than in any other way. By making such an exposition a bonded warehouse, our importers and their foreign correspondents would willingly place in them many illustrations of European production, which could be afterwards sold or returned.

Passing this point, attention is also called to the Centennial Exposition of 1876. The declaration was general, especially with the Germans, that they should attend it, and if properly conducted it cannot but be a success. Besides the Europeans who will visit it, it will collect large numbers of people from South America and the West Indies, and many from Japan and the East. The Japanese have already signified their intention of making a full and imposing display of their productions.

In view of these facts, the policy cannot be too strongly

urged, of making an early effort for a full exhibition by the State of Massachusetts at this exposition.

Among the branches which were most thoroughly developed at Vienna was that of education. It was made a matter of great prominence by the directors of the Exposition, and the means of illustration, in buildings, material for instruction, publications, etc., were numerous. This portion of the exhibition and our place in it is passed over here, as the Special Commissioner, Mr. Philbrick, has, no doubt, fully developed it.

Among other objects of the Exposition, an endeavor was made by its promoters to take advantage of the number of strangers whom they expected it to bring together to hold a series of congresses upon important international matters. Of these, that upon patents was perhaps the most important to our interests. The patent laws are at present in a very unsatisfactory condition on the Continent. Either it is almost impossible to procure a patent, or with states which grant them, the construction of the courts are such that they are practically valueless. The industrial activity of the United States, however, and the apparent influence of our patent system on invention, are beginning to have their effect; and there is a large portion of the more liberal party which desire to introduce the advantages of a good patent system. In England, also, there is a strong disposition to alter their patent laws, so as to make them more like ours. It was believed that if those of this way of thinking could organize and unite upon a strong declaration in favor of patents as promoters of industry, and could prepare a simple statement of the principles upon which a good patent law should rest, such action would be the first, and a very large, step towards the desired alteration of their patent laws.

At the request of the Director-general of the Exposition, Baron Schwarts Sanborn, who took a most lively interest in this congress, the undersigned believing that he should subserve the interest of the State in so doing, became a member of the preparatory committee, and afterwards at the nomination of the same gentleman, was elected vice-president of the congress on the part of the United States. This body car-

ried out its work in the most satisfactory manner, and at its adjournment instituted a permanent committee to carry on the agitation of the matter, with authority to call another meeting when it should seem advantageous. It is reported that this congress is already producing fruit, and that both Switzerland and Belgium, at present without a patent law, are very seriously debating the necessity of establishing one, while the effect of its action is also felt in other states. If this congress should result, as there is ground to hope it will, in the establishment of a good and well administered patent law on the Continent, it will be a matter of vast advantage to our inventors and manufacturers.

HAMILTON A. HILL,

*Associate-Commissioner for Massachusetts to Exposition at Vienna.*

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**T A B L E S**

**OF**

**REPORTS, EXHIBITS, Etc.,**

**REFERRED TO.**

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*List of Special Reports prepared for the Massachusetts Commission.*

## ARTS.—Technical Schools.

Painting.

Sculpture.

Ceramic Arts.

Photography.

Interior Decoration.

## SCIENCE.—Architecture and Building.

Waste Materials.

Dentistry and Dental Instruments.

## MECHANICS.—Prime Movers.

Iron and Wood Working Machinery.

American Inventions, as seen in other portions of  
the Exposition.

Railroad Telegraphy.

## AGRICULTURE.—As shown in Exposition.

Austrian modes of.

Forestry in the Exposition.

ARTICLES OF FOOD, &C.—Effects of free consumption of wine and beer on  
the mass of Austrian people.

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*Number of Exhibitors from the different nations referred to in  
Mr. Hill's report.*

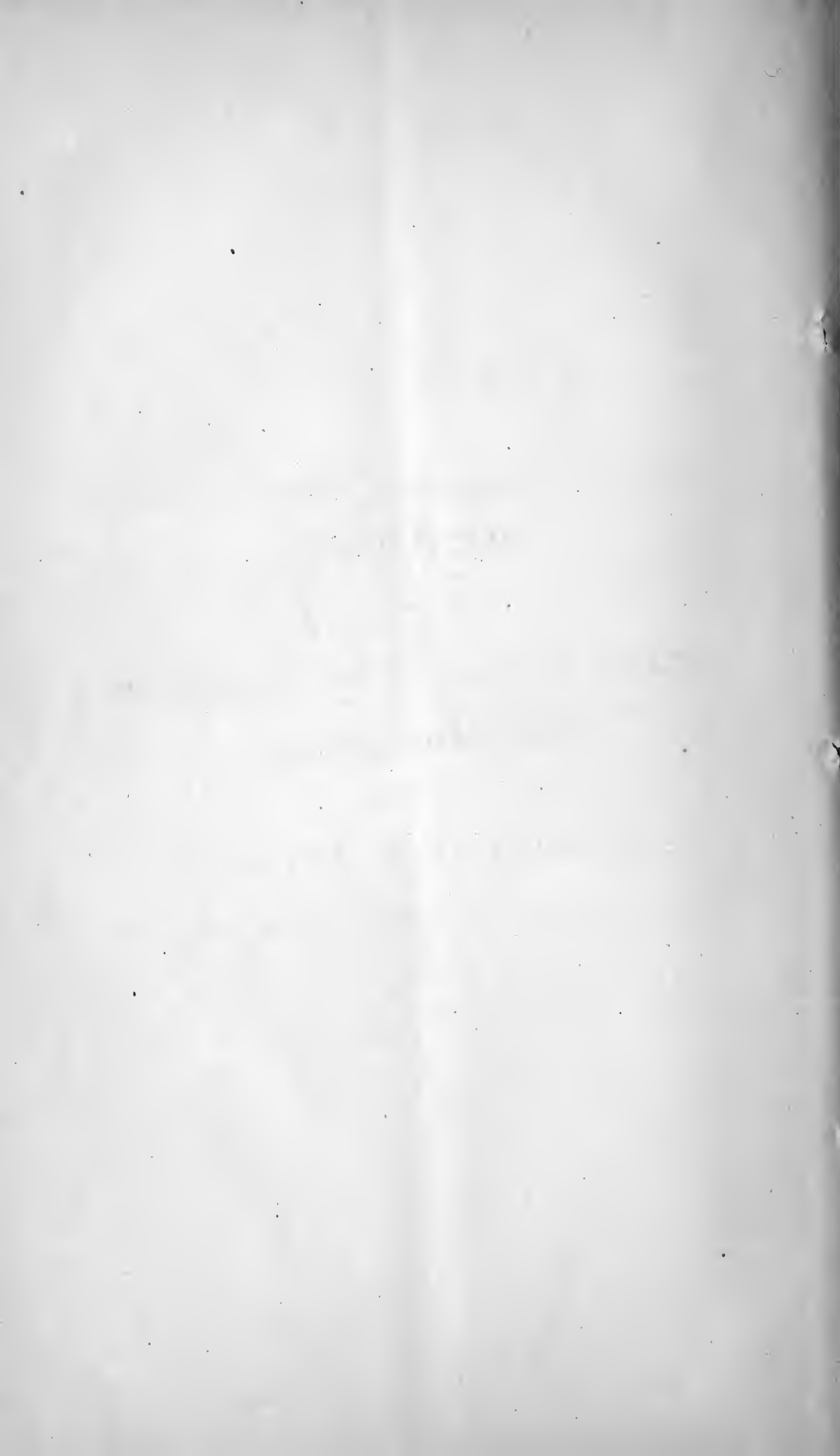
United States, . . . . .	914	Russia, . . . . .	1,197
Venezuela, . . . . .	294	Caucasus, . . . . .	281
Great Britain and Colonies, .	1,741	Greece, . . . . .	293
Portugal, . . . . .	433	Turkey, . . . . .	5,843
Spain, . . . . .	2,181	Roumania, . . . . .	1,470
France, . . . . .	3,691	Egypt (by Government).	
Switzerland, . . . . .	1,074	Tunis, " objects,	641
Italy, . . . . .	3,735	Morocco, " "	
Morocco, . . . . .	13	Persia, " "	
Sweden, . . . . .	944	Siam, " "	
Norway, . . . . .	152	China, " "	
Denmark, . . . . .	475	Japan, " objects,	4,000
Belgium, . . . . .	550	Guatemala, . . . . .	16
Netherlands, . . . . .	355	Chili, . . . . .	—
Germany, . . . . .	5,789	Brazil, . . . . .	222
Austria, . . . . .	7,382	Uruguay, . . . . .	61
Hungary, . . . . .	3,478		

*Space in Square Metres allotted to each Country in the Industrial, Machinery and Agricultural Halls.<sup>1</sup>*

C O U N T R I E S .	Industrial Hall.	Covered Courts.	Machinery Hall.	Agricultural Hall.
Austria, . . . . .	14,767	15,000	11,000	13,000
Germany, . . . . .	6,714	2,000	10,000	8,000
France, . . . . .	6,308	3,500	5,580	2,500
England, . . . . .	6,369	2,500	5,305	7,000
Russia, . . . . .	3,319	800	1,250	600
Hungary, . . . . .	2,972	1,000	350	7,500
Italy, . . . . .	2,972	—	950	950
Turkey, . . . . .	2,938	—	—	—
Belgium, . . . . .	2,613	700	3,000	356
China, Siam and Japan, . . . . .	1,650	800	—	—
United States, . . . . .	1,358	1,500	1,250	1,150 <sup>2</sup>
Switzerland, . . . . .	1,125	900	3,049	475
South America, . . . . .	1,090	—	—	—
Egypt and Central Africa, . . . . .	1,003	—	—	—
Holland, . . . . .	880	500	240	275
Greece, . . . . .	867	—	—	—
Sweden and Norway, . . . . .	865	—	280	260
Roumania, . . . . .	637	—	—	—
Spain, . . . . .	605	—	—	640
Portugal, . . . . .	519	—	—	350
Persia and Middle Asia, . . . . .	346	—	—	—
Tunis, . . . . .	259	—	—	—
Morocco, . . . . .	86	—	—	—
Denmark, . . . . .	—	800	300	170

<sup>1</sup> These measures must be taken as approximate merely. It was impossible to get reliable statements from authoritative sources. In the above table, no note is taken of separate buildings erected by various governments and individuals, except in the case of the agricultural hall of the United States.

<sup>2</sup> Separate building.



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**R E P O R T**

**ON**

Textile Fabrics, Raw Materials,  
and Machinery.

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**BY HORATIO G. KNIGHT.**

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# 1000000

The first of these is the fact that the  
population of the United States is  
increasing at a rapid rate. This is  
due to a number of factors, including  
immigration and a high birth rate.

The second factor is the fact that the  
United States is a large country with  
a wide variety of resources. This  
allows for a high standard of living  
and a high level of economic development.

The third factor is the fact that the  
United States has a strong military  
power. This has allowed the country  
to maintain a high level of security  
and to project its power around the world.

The fourth factor is the fact that the  
United States has a strong cultural  
influence. This has allowed the country  
to maintain a high level of cultural  
development and to project its influence  
around the world.

The fifth factor is the fact that the  
United States has a strong economic  
power. This has allowed the country  
to maintain a high level of economic  
development and to project its power  
around the world.

The sixth factor is the fact that the  
United States has a strong political  
power. This has allowed the country  
to maintain a high level of political  
development and to project its power  
around the world.

The seventh factor is the fact that the  
United States has a strong social  
power. This has allowed the country  
to maintain a high level of social  
development and to project its power  
around the world.

The eighth factor is the fact that the  
United States has a strong scientific  
power. This has allowed the country  
to maintain a high level of scientific  
development and to project its power  
around the world.

The ninth factor is the fact that the  
United States has a strong artistic  
power. This has allowed the country  
to maintain a high level of artistic  
development and to project its power  
around the world.

The tenth factor is the fact that the  
United States has a strong spiritual  
power. This has allowed the country  
to maintain a high level of spiritual  
development and to project its power  
around the world.

## REPORT.

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His Excellency the governor, in his address to the two branches of the legislature, expressed a doubt whether the representation of the Commonwealth at the Vienna Exhibition would result in the great benefit that was predicted by many.

He alluded to the chief causes of failure, and gave the Massachusetts Commission credit for having labored faithfully and intelligently to secure the best attainable results.

It may well be questioned whether it was expedient for *any* State to send out a paid commission, charged with duties that should have been well performed by United States commissioners.

The Massachusetts Commissioner on behalf of industrial interests, explains the hindrances to his own success, points out many defects in the arrangement and organization of the Exhibition, and makes suggestions in his report which may be of much value to the State in its preparation for *future* exhibitions.

It is therefore more than possible that such advantages will accrue to the Commonwealth, from its representation at Vienna, as to justify the appropriation that was made for the industrial, as well as for the educational branch of the Commission.

If a new impulse shall be given to any one of our great industrial interests, or if our people shall be more impressed with the importance of industrial and scientific education, the labors of the Commission will not have been in vain.

The undersigned would gladly have given more time to his duties as an Associate, but for the reasons that are stated in the Commissioner's report. It seemed to be useless to go to Vienna while the Exhibition was in a state of disorder.

After making a hurried survey of the whole Exhibition, which required more than one week, the time that remained—about three weeks—was mostly devoted to textile industry, as there represented in various ways, upon which a brief Report will now be given.

Writers for the press, and others, have described the general plan and arrangement of the Exhibition, which was in twenty-six groups, with numerous additional exhibitions.

Group V. was Textile Industry and Clothing.

It is said by those who had the best opportunities for observing, and it is an unquestioned fact, that never at any previous Exhibition was textile industry so prominently represented, or its importance so well shown, as at the Vienna Universal Exhibition. Never before was there brought together a series of exhibits so complete, or so significant of progress in the various branches of this industry. Its almost numberless branches were clearly shown, and the relation between textile and other industries was distinctly expressed.

Although, in our modern civilization, it is understood that coal, iron and textile fibres range in importance in the order here mentioned, the textile industry claimed much space, and was more prominent than any other at Vienna.

It was no easy task to obtain a general view of this department, as the various exhibits belonging to it were widely separated, and in several buildings. The Agricultural Halls contained a variety of raw materials, and machines for cultivating the same; there were many things in the Machinery Halls belonging to textile industry; and the great Industry Palace contained an immense and somewhat confusing collection of textile fabrics from all parts of the world, including articles of utility, of ornament, and of luxury.

A careful examination of all these exhibits, and the preparation of an elaborate report thereon, would have been a labor of several months for more than one man. It would have necessitated a thorough investigation of a great variety of raw materials, to ascertain the new channels they open for manufacturing operations; the examination of numberless textile fabrics, to obtain from them evidence of mechanical progress and chemical development in this branch of man-

ufacture; and the inspection of a great variety of machinery that was exhibited for preparation, spinning, weaving, braiding, dyeing, printing, ornamenting and finishing.

This work has been done with more or less thoroughness, and reports of much interest and value have been or will be made by commissioners and others. A series of valuable articles on the textile industry at Vienna, have already been published in an English journal that is seen by many artisans, manufacturers and scientists in this country. The official catalogues of several countries contain important information relative to their various industries.

It is believed that textile industry alone was represented at Vienna by nearly ten thousand exhibitors, if we include the exhibits of fibres, apparatus and machinery; but without including these, the number, as shown by the catalogues, was—

For Austria and Hungary, . . . . .	about 2,500
Germany, . . . . .	“ 1,100
France, . . . . .	“ 750
Switzerland, . . . . .	“ 400
England, . . . . .	“ 300
Italy, . . . . .	“ 300
Turkey, . . . . .	“ 300
Greece, . . . . .	“ 225
Russia, . . . . .	“ 200
Tunis, . . . . .	“ 175
Belgium, . . . . .	“ 150
Sweden, . . . . .	“ 50
Denmark, . . . . .	“ 75

Exhibits from various other countries, including the United States, would make up a total of at least 8,000 exhibitors of textile fabrics and clothing.

These figures indicate the extent of this branch of the Vienna Exhibition; but its magnitude will be better appreciated when it is stated that, in many instances, a single exhibitor displayed a great variety, as well as a large quantity of goods. This was especially noticeable in the Austrian sections. The exhibits of that country alone, in eleven sections, constituted an immense exhibition.

The exhibits of France were also in eleven sections, illustrating, in their arrangement, the skill and taste for which the people of that country are distinguished.

The German exhibits were well displayed in eight sections.

From those countries, as well as from Switzerland, Belgium and England, there were collective exhibits of great beauty and interest, consisting of fabrics in silk, wool, cotton, flax, hemp and jute; and clothing of all descriptions, for both sexes.

No collective exhibit was more interesting than that by the silk manufacturers of Crefeld, Germany. The history of the silk industry of Crefeld is very instructive, and may well be studied by any one about to engage in that branch of manufacture.

The silk manufacturers of Lyons also united in a magnificent display of their fabrics, occupying an entire court of the Palace.

The Macclesfield Chamber of Commerce exhibited a beautiful "Trophy of Silk," comprising articles peculiar to that place, furnished by nine of its manufacturers.

The most celebrated manufacturers of silk, woollen, linen and dress goods, in France, Germany, Belgium and Great Britain—whose names are well known in this country—exhibited some of their choicest productions.

From Oriental countries there were numerous collections of webs and tissues, chiefly the productions of manual labor according to old usages and methods, distinguished in design and coloring by native taste. These attracted much attention.

There were several exhibits illustrating the processes of manufacture, the silk industry being thus most completely illustrated.

In the United States department there were less than forty exhibits in Group V., and but few of these were from Massachusetts, whose manufacturers could have furnished five times forty contributions to that branch of the Exhibition. It certainly was remarkable that a State which leads all the others in the manufacture of woollen, cotton and worsted goods, as well as the manufacture of boots and shoes, contributed so little to this last and greatest Universal Exhibition. There

was, however, but little inducement to participate in an exhibition that promised no immediate substantial returns.

This branch of the United States department was too meagre, and too mean, to reflect any credit upon the country, and could only tend to convey a false impression concerning its advancement in textile industry.

The exhibits of the raw textile materials were numerous, including some that are little known in this country, and but little used elsewhere.

Much interest was expressed in the fibres of certain plants exhibited by Dr. Collyer in the United States department, which are said to have been cultivated with success in various countries during the last few years. In the Brazilian department there was a long fibrous textile product, extracted from the stems of a bulbous plant, resembling mohair; also fibres from Tucum, in various degrees of treatment, some of which were similar to sheep's wool.

The United States exhibited a large collection of cotton, including beautiful samples of the Sea Island, and there was cotton from China, Egypt, Syria, Southern Russia, Algeria, Central America, and several other countries.

It was thought that the exhibits of cotton from Egypt, Russia and Algeria, furnished evidence of progress in the cotton-culture of those countries.

The flax culture was largely represented by Germany, Austria and Great Britain.

The culture of hemp was best represented by Russia; a country that is endeavoring to produce all raw textile materials for weaving.

Jute was prominently represented, and has become an important material for yarns, being extensively used in carpet-weaving as a substitute for hemp. It is being applied to new purposes, as was shown in the Austrian, German, Dutch, Belgian, French and English departments.

There were exhibitions of wool of every description, from all countries; also goat's hair from various countries.

There were collections of silk, in all its varieties, from all silk-growing countries, making a very instructive exhibition. So well was this material represented, that one could there learn more about its quality and treatment than could be

learned in a short time from any treatise or book. It is understood that Italy is making rapid progress in this and many other branches of industry.

Our Massachusetts manufacturers are generally well acquainted with all machinery and raw materials adapted to their wants, are promptly informed of all inventions and improvements, and are not slow to adopt whatever is valuable.

Some of the numerous exhibits of textile fabric machinery and apparatus will now be referred to, full descriptions and illustrations of which are easily attainable by any one desiring the same.

Machinery for the cotton branch of textile industry was poorly represented. Switzerland alone showed a complete series of cotton-spinning machines, without any noteworthy improvements, by Jacob Reiter & Co., of Winterthur.

Wool-washing was chemically represented by German houses, and the mechanical process by McNaught & Co., of England, who exhibited machines of improved construction.

A wool-opening machine was exhibited by M. Celestin Martin, of Verviers, Belgium, capable of working 400 pounds of wool per hour; also a self-acting oiling-machine of simple construction, with which, it is said, a single workman can oil 3,000 pounds of wool in twelve hours. Other machines were shown by the same well-known engineer. Excellent wool-combing machines were shown by Platt Brothers, of Oldham, England.

Wool-carding was largely represented by well-known German, Belgian and English houses, some of whom claimed important improvements. The machines of M. Martin, who exhibited two systems of carding, attracted much attention.

Wool-spinning was well represented; and here again the machines of M. Celestin Martin were conspicuous. The self-actor for carded wool, by M. Bede, of Verviers, contains interesting and original features of probable value.

Much interest was manifested in the patent continuous wool-spinner, by John G. Avery, of Worcester County, Mass., which, it is claimed in his circular, "will do more and better work with one-half the number of spindles at less than half

the expense, occupying less than one-quarter the space than the most improved process now in use in Europe.”

Flax, hemp and jute-spinning were probably best represented by Great Britain, though there were interesting exhibits from other countries. Flax-breaking machines were largely represented in the Austrian, German, and other departments. Dr. Collyer exhibited a flax-breaking and scutching-machine in the American department.

Machinery and apparatus belonging to the silk industry were represented by Switzerland, France, Italy, Germany and Austria; also in an interesting manner by Turkestan and Japan. There was a remarkable exhibition of machinery for working silk waste, by Theodor and Fredric Bell, engineers, at Kriens, near Lucerne; all of which is worthy of description and illustration. Great progress is being made in this comparatively new branch of industry.

Caspar Honegger, of Rüti, Canton Zurich, showed the most numerous exhibits for silk-weaving. There was also interesting silk machinery from another Swiss house, that of Scheller & Berchtold, of Thalweil, near Zurich. Looms for weaving silk ribbons, with six shuttles, by F. Wahl, of Basle; and a series of looms for various purposes and materials, by M. Kuffmaul & Son, of the same place, were deserving of notice. Among the latter was one for taffeta ribbons, with revolver-slay, and a new motion for the leaves, actuated by means of eccentrics; and one for velvet ribbons, with a crochet-slay, and a jacquard apparatus at its side.

In the German department there were looms for silk-weaving, by Felix Tonar, of Dülken, including one for weaving glazed silk-stuff. It is said that the works of Mr. Tonar have been started for the purpose of making the Rhenish silk industry independent of foreign manufacturers of machinery.

Looms for mixed stuffs and for heavy goods were prominently represented. The new and novel apparatus for weaving, by George Hodgson, of Bradford, England, is believed to be worthy the attention of all interested in textile industry. He exhibited other looms, including one of the best construction, with the circular box and six shuttles. There was also a collection of looms, apparatus, etc., for the weaving process.



all of excellent workmanship, by Henry Livesey, of Greenbank, Blackburn.

Escher, Wyss & Co., of Zurich, exhibited looms for weaving colored stuffs, arranged for different mountings, and to work with three, with four, and with five shuttles.

Kuffmaul and Sons, of Basle, exhibited a loom for tapestry, with high warp, with a jacquard machine of 1,500 lifting wires.

Conspicuous in the German department, were the looms and the tools connected with weaving, exhibited by the Sächsische Webstuhlfabrik (formerly Louis Schöenherr), of Chemnitz. These looms are said to be adapted for the lightest as well as for the heaviest stuffs; for the closest and for the widest arrangement of warp; with change of weft; with or without the jacquard machine. This company was formed in 1851, and now employs about 700 workmen.

The Crompton loom, in a lighter and more simple form than heretofore made, was exhibited by the Sächsische Maschinen Fabrik (formerly Richard Hartmann).

In the Austrian department several looms were in operation, including those of the Tannenwald Cotton Works, which appeared to be composed of all possible elements of other looms, but good, both in combination and workmanship. There was one loom in the American department, constructed and exhibited by the Star Tool Company of Providence, which has two or three interesting details, and makes 300 picks per minute.

Reference will be made to only a few more machines, all of which, it was claimed, contained new and interesting details, namely: A warping-frame and a warp-dressing machine, by the Erste Brünner Maschinen Fabriks Gesellschaft, Brunn. A mechanical knitting-loom, by Ernst Supe, of Limbach (and here it may be mentioned, that the well-known Lamb knitting-machine, and several others, were exhibited). A covering and twisting machine, and a cord-making machine, by G. Stein, of Berlin. A singeing machine, and other machines for finishing, by the Zittauer Maschinen Fabrik und Eisengiesserei, Zittau: also a drying machine by the same company. Stretching machines, by William Birch, of Manchester, and by J. Ducommun & Co., of Mulhouse. A crapping machine, by A. Kiessler, of Zittau; and a calendering

machine for woollen fabrics, by the same engineer. An eight-color perrotine printing-machine, constructed and exhibited by C. Bialon, of Berlin. Finally, what appeared to be a remarkable machine for embroidery, by Reitmann, of St. Gall, Switzerland.

Other textile fabric machinery and apparatus, of equal, or even greater importance, may have escaped the notice of the writer of this paper: whose knowledge of machinery is limited, and whose time for its examination was short.

A single remark concerning the Philadelphia Exhibition. If Massachusetts is to be well represented there, she must make wise and timely preparation. The countries that made such preparation, of which England was one and Belgium another, were most successful at Vienna.

While Massachusetts is greatly in advance of all the other States in respect to several important industries, reliable statistics show that she is behind four others in the silk industry, and especially in the matter of weaving.

The undersigned will conclude this brief and necessarily imperfect Report on the branch of the Exhibition in which he was most interested and spent most time, by expressing the hope that the attention of our capitalists, and others, may be so directed to the silk manufacture, that we may at no distant day, occupy in this the same enviable position that we hold in other branches of the textile industry.

HORATIO G. KNIGHT.





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